US HEAVY CRUISERS 1941–45

Pre-war Classes

MARK STILLE

ILLUSTRATED BY PAUL WRIGHT

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NEW VANGUARD 210

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CONTENTS

INTRODUCTION 4

NAVAL STRATEGY AND THE ROLE OF THE HEAVY CRUISER 4

USN HEAVY CRUISER DESIGN AND THE NAVAL TREATIES 6

USN HEAVY CRUISER WEAPONS 8

USN HEAVY CRUISER RADAR 10

PENSACOLA CLASS 11
- Design and Construction
- Armament
- Service Modifications
- Wartime Service

NORTHAMPTON CLASS 17
- Design and Construction
- Armament
- Service Modifications
- Wartime Service

PORTLAND CLASS 25
- Design and Construction
- Armament
- Service Modifications
- Wartime Service

NEW ORLEANS CLASS 30
- Design and Construction
- Armament
- Service Modifications
- Wartime Service

WICHITA CLASS 42
- Design and Construction
- Armament
- Service Modifications
- Wartime Service

ANALYSIS AND CONCLUSION 45

BIBLIOGRAPHY 47

INDEX 48

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US HEAVY CRUISERS 1941–45

PRE-WAR CLASSES

INTRODUCTION

In the interwar period, the United States Navy (USN) built 18 large cruisers. These came to be known as "heavy cruisers" because of their size and later because of their armament. All of these ships were built under limitations resulting from a series of naval treaties, and thus they were also known as "treaty cruisers." These ships gave valuable service during World War II and saw action in all the major battles in the Pacific. A separate volume will cover the heavy cruisers built during and after the war that saw service not only in 1941–45, but also later in the Korean and Vietnam conflicts.

AMERICAN NAVAL STRATEGY AND THE ROLE OF THE HEAVY CRUISER

The heavy cruiser was a staple in the USN during World War II. The term came into use in 1920 to distinguish it from a light cruiser in terms of size and importance. In 1931, the use of the term was clarified and applied to any cruiser with 8in guns. Traditionally, American cruisers were seen primarily as

US Navy heavy cruisers were the centerpiece of the pre-war Scouting Force. Here, four ships turn in formation to create a 'slick' for landing their floatplanes off Pearl Harbor in 1933. From inboard to outboard are *Chicago*, *Louisville*, *Salt Lake City*, and *Northampton*. (NHHC)

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This pre-war view shows *Salt Lake City* in the foreground, with *Northampton*, *Portland*, *Louisville*, and *Chester* in formation. Operating together in this fashion, heavy cruisers formed powerful strike groups that were used for a variety of missions when the war began. (NARA)

scouting ships in support of the main battle fleet and, in addition, were tasked to counter enemy scouting forces and screen the battle fleet. Their speed and range also made them well suited as commerce raiders or for protecting shipping lanes against enemy raiders.

The Washington Naval Treaty of 1922 magnified the importance of heavy cruisers. Since the treaty placed limits on the number of battleships that the USN could operate but not on heavy cruisers, the latter became a substitute for the battleship. The smaller number of battleships meant that they were less likely to be risked, especially on secondary missions. In their place, heavy cruisers were an obvious substitute.

Going into the Pacific War, heavy cruisers were assigned to the Fleet Scouting Force, which reflected their primary mission. In addition to their scouting mission in support of the battle fleet, heavy cruisers were assigned as escorts to the Pacific Fleet's carriers. This was a natural fit, since the heavy cruiser had the speed and endurance to keep up with the carriers, but it was also seen as necessary to protect the carriers from Japanese cruisers or battlecruisers. The heavy cruiser also possessed a relatively heavy antiaircraft fit that could help protect the carrier from air attack.

At the start of the Pacific War, the importance of the cruiser was immediately elevated. The attack on Pearl Harbor reduced the strength of the USN's battle line and demonstrated that the war would not be fought between opposing battle fleets, but that carrier aviation would be dominant. The vulnerability of older USN battleships to torpedo damage was also clearly in evidence. As the carrier became the center of American naval operations, the heavy cruiser became an integral part of carrier task forces. Cruisers were the primary escorts for the carriers during the series of early war carrier raids between February and April 1942, and during the first two carrier battles in the Coral Sea in May and at Midway in June.

When the focus of operations in the Pacific shifted to the South Pacific, beginning in August 1942, the heavy cruiser assumed another role as the leading element of surface task forces committed to engaging the Japanese Navy at night in the waters around Guadalcanal. From August until November, there were five major battles against the Japanese, with American heavy cruisers being the centerpiece of the American task forces in all but one. Against the well-drilled Japanese, who had spent considerable time and

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The two cruisers to the left are the first-generation treaty cruisers *Salt Lake City* and *Pensacola*. Inboard of them is the third-generation *New Orleans*. This photograph was taken at Pearl Harbor on October 32, 1943, and shows clearly the differences between the generations. The low freeboard of the first-generation ships is obvious, as is their top-heavy appearance with the large tripod foremasts. (NHHC)

resources developing and practicing night-fighting doctrine and equipment, the American heavy cruisers suffered severely. The extent of the carnage is shown by the fact that of the 14 heavy cruisers active during the campaign for Guadalcanal, five were sunk and another seven damaged.

After the struggle for Guadalcanal concluded with an American victory in February 1943, USN heavy cruisers continued to take a prominent role in the advance to Japan. Given additional antiaircraft weaponry, they continued to perform admirably as carrier escorts. They showed their versatility as they were employed in a number of roles, including shore bombardment and engaging Japanese surface units when the opportunity was presented. Heavy cruisers also were active in the European theater in convoy escort and shore bombardment roles. By the end of the war, seven of the 18 treaty heavy cruisers had been sunk, but victory had been secured.

USN HEAVY CRUISER DESIGN AND THE IMPACT OF THE WASHINGTON AND LONDON NAVAL TREATIES

Coming out of World War I, the USN planned a massive expansion. Part of this would be the construction of a large number of cruisers to screen the battle line and the battlecruiser force, and to form forces dedicated to scouting and providing protection from enemy scouting forces. The most likely opponent was judged to be the Japanese, but the USN was also driven to gain parity with the Royal Navy.

Originally, the cruiser design to fill these needs was based on the Omaha-class scout cruiser; a 7,100t ship armed with 12 6in guns and a top speed of 35kt. This changed with the ratification of the Washington Naval Treaty in February 1922. Because it thought a larger cruiser was required for the

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expanses of the Pacific, the USN was happy with the limitations on cruisers contained in the treaty, which were set at 10,000t with a gun no greater than 8in. While there were limits on individual ships, there was no limit set on the overall tonnage or number of cruisers that each power could build. For the USN, the upper limit of cruiser size became the standard design size for all. Since the Americans did not want to build ships with inferior armament to foreign contemporaries, 8in main batteries also became the norm.

Since the treaty set limits on battleship tonnage for the world's five principal navies, and none was set for cruisers, a cruiser building spree quickly ensued. In late 1922, the USN planned to finish the construction of the ten planned Omaha-class cruisers and 16 new 8in cruisers. However, Congress was reluctant to fund what it saw as excessive requests and, during the interwar period, the USN was tardy building up to its allowed limits. With evidence of Japanese heavy cruiser construction, Congress approved eight cruisers in late 1924, but funded only two. The other six were not funded until 1926 and 1927.

The first American heavy cruiser designs under the Washington Treaty favored firepower and speed over protection. The first generation of treaty cruisers were called 'tinclads' because of their sparse armor. These ships of the Pensacola and Northampton classes were well under the 10,000t treaty limitation, and therefore were not well-balanced designs. After a transitional design of the two ships of the Portland class, American designers hit their stride with the much more successful New Orleans class. These seven ships were well protected and maintained a high speed and powerful main and secondary batteries.

Since the Washington Naval Treaty imposed no limit on the numbers of cruisers that could be built, the primary goal of the London Naval Conference, opened in January 1930, was to place a cap on cruiser construction. With the Americans and British open to this notion, negotiations yielded an agreement to create two different types of cruisers and to limit the tonnage for each. Type A cruisers were those armed with guns of 6.1in or more (i.e. heavy cruisers), and the maximum 10,000t limit from the Washington Naval Treaty remained in place. The USN was allotted 180,000t of Type A cruisers, which easily translated into 18 10,000t ships. The Americans agreed not to build to their 18-ship limit immediately. Assuming 15 cruisers were completed by 1935, the USN was

This view, taken in 1936, shows the differences between the second- and third-generation treaty cruisers. *Tuscaloosa* (New Orleans class) is alongside the pier with *Chicago* outboard. Note the different 8in turrets and the different aft superstructure. *Chicago* has a large tripod mainmast aft while the aft part of *Tuscaloosa*'s superstructure is the aircraft hangar. (NHHC)

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The reason for building a cruiser was to get big guns to sea on a large, fast platform. This is *Pensacola* in rough waters off the Aleutians in 1945. The cruiser's two forward gunhouses are on display. Because of their sparse armor, only 2.5in on the face, 1.5in on the roof, and .75in on the sides and rear, these are actually gunhouses and not turrets. (NARA)

not allowed to start construction on the 16th ship until 1933 (being commissioned in 1936), with the final two ships begun at yearly intervals after that. This affected the construction of the last two units of the New Orleans class and the unique *Wichita*, which was the 18th and last treaty heavy cruiser built. The system of naval treaties in place between the wars meant that all 18 USN heavy cruisers built during this period were designed with a series of compromises in mind. It was only after the expiration of these treaties that a heavy cruiser was designed that could fully incorporate the competing requirements of firepower, speed, and protection.

USN HEAVY CRUISER WEAPONS

The 8in gun was accepted without debate as the primary heavy cruiser weapon. It had a longer range than the 6in gun mounted on existing American and British large cruisers, so it was assumed that any 8in gun-armed ship would possess an advantage. The 8in gun also possessed greater striking power against heavily armored targets. Conversely, the 6in had a much greater rate of fire, but in the end the greater range of the 8in gun prevailed. During the Guadalcanal campaign, the 8in gun was preferred because of its greater penetrative power against Japanese heavy cruisers or battleships. Later, in the Solomons campaign, as the primary opponent became Japanese destroyers, the heavy cruiser lost favor opposed to light cruisers with faster-firing 6in guns.

USN Heavy Cruiser Main and Secondary Guns

Type	Muzzle Velocity (ft/sec)	Max Range (yd)	Rate of Fire (rds/min)
8in/55 Mk 9 and 14	2,800	31,860	2–3
8in/55 Mk 12 and 15	2,500	30,050	2–3
5in/25	2,110	14,500	14
5in/38	2,600	18,200	15–20

The older Mk 9 and 14 guns equipped the Pensacola, Northampton, and Portland classes, and some ships of the New Orleans class. The much lighter Mk 12 gun was fitted on four ships of the New Orleans class (*Tuscaloosa*, *San Francisco*, *Quincy*, and *Vincennes*) and the unique *Wichita*. These developed a lower muzzle velocity and consequently a shorter range. *Minneapolis* carried the Mk 15 gun. American 8in turrets suffered from a dispersion of shot problem. This problem was not solved until the gun barrels were separated more, but this was not done until the new turret design on *Wichita*.

USN heavy cruisers generated fire-control information from two fire-control directors; one was mounted forward on the bridge superstructure and the other on the aft superstructure. American fire-control equipment was of a high standard and was superior to the IJN's. Originally, the Mk 18 director was fitted on the Pensacola class, the Mk 24 on the Northampton class, and the Mk 27 on the Portland class. These were replaced by the Mk 35, Mk 31, and Mk 34 respectively. *Wichita* was

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completed with the Mk 34 director and this system was refitted on several cruisers during the war. Beginning in 1942, existing directors were fitted with dedicated radar, which greatly increased their accuracy and provided a blind-fire capability and the opportunity to engage targets at night.

Unlike Japanese heavy cruisers, which were designed with a substantial torpedo armament, the USN considered its heavy cruisers to be primarily gun platforms. Originally, the Pensacola and Northampton classes carried two triple banks of 21in torpedoes, but by 1935 the US Navy had decided to remove torpedoes from its heavy cruisers. The thinking was that actions would be fought at ranges that would never allow cruisers to use their torpedoes. This turned out to be a questionable decision in light of the short-range actions fought at night against the Japanese in 1942, but it probably did not matter given the poor performance and reliability of American torpedoes during that time.

The secondary gun for all but one of the 18 treaty heavy cruisers was the 5in/25 single mount. This gun crew is pictured on *Astoria* during gunnery drills in 1942. The 5in/25 was an adequate weapon with a high rate of fire in the hands of a well-drilled crew. (NHHC)

American cruisers began the war with a respectable level of antiaircraft protection by virtue of their secondary battery of eight medium-range 5in/25 weapons. This gun had a short barrel, which reduced range and accuracy, but it excelled in rate of fire. In the antiaircraft role, it could hurl a 54lb shell up to 27,400ft. A well-drilled crew could fire 14 rounds per minute. Only *Wichita* received the even better 5in/38 gun, which was generally considered to be the best dual-purpose naval weapon of the war.

USN heavy cruisers were deficient in short- and medium-range antiaircraft weapons at the start of the war. The eight .50-cal machine guns fitted were intended to defeat dive-bomber attack, but were clearly insufficient for this purpose. This was identified before the war and the USN was already in the process of upgrading antiaircraft protection for its cruisers before the war began. It was intended to place four 1.1in quad mounts on each cruiser and to replace the machine guns with 20mm single mounts. However, production shortages prevented this from being released until early 1942. In any event, the 1.1in mount proved to be unreliable and lacked range. Beginning in 1943, these were replaced with the 40mm Bofors gun, usually in quad mounts but also in twin mounts when top weight issues prevented a quad mount from being used. The 40mm quad mount was the iconic USN antiaircraft weapon of the war and proved very effective in service. Fire control was provided by the Mk 51 director and the weapon proved effective to about 3,000yd. The standard short-range antiaircraft weapon aboard USN heavy cruisers from 1942 was the Swiss-designed 20mm Oerlikon gun. This weapon was air-cooled, required no external power source, and was comparatively lightweight, so could be fitted in relatively large numbers aboard cruisers. It was originally fitted as only a single mount, but late in the war a twin mount was provided to increase firepower. The 20mm was a last-ditch weapon effective only to about 1,500yd. Late in the war, it was replaced

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whenever possible by the heavier 40mm gun, since its small shell lacked the punch to knock down kamikazes.

USN Heavy Cruiser Antiaircraft Guns			
Type	**Muzzle Velocity (ft/sec)**	**Max Range (yd)**	**Rate of Fire (rds/min), theoretical**
0.5in Browning M2 water-cooled machine gun	2,930	7,400	550–700
1.1in Mk 1/1	2,700	7,400	140
20mm Oerlikon	2,740	4,800	450
40mm Bofors	2,890	11,000	160

USN HEAVY CRUISER RADAR

The widespread and early provision of radar gave USN cruisers a critical advantage against the Japanese in both surface gunnery engagements and in detecting and engaging aerial targets. The first radar fitted aboard heavy cruisers was the experimental CXAM radar, which had a large mattress antenna usually mounted on the foremast. This set had a theoretical maximum detection range of 16nm against large surface targets and 70nm against a large aircraft at 10,000ft. It was fitted aboard *Pensacola*, *Northampton*, *Chester,* and *Chicago*.

In 1942, the SC radar was produced in sufficient quantity to equip all cruisers. This was a device that tried to match the CXAM's electronics with a smaller antenna, but was not a success and the radar was frequently outperformed by Japanese optics in surface engagements in the Solomons campaign. The SC-1 improved set quickly appeared, which had twice the power and roughly twice the range. This translated to approximately 20nm for a large surface target and 60nm on a large aircraft.

The SC/SC-1 was replaced by the much more powerful SK air search radar. This became the standard cruiser air search radar and could detect a large target at up to 100nm flying at 10,000ft. It was usually mounted at the top of the foremast. Late in the war, as cruisers underwent air defense modernization, several were fitted with the SP radar. This radar had only a 50nm maximum range against a large, high-flying target, but it did provide fairly accurate elevation accuracy. It was thus critical for guiding fighters against kamikazes.

The mainstay surface search radar for cruisers was the SG radar. This was the first microwave radar to incorporate a display, which made interpretation much easier. The first production model appeared on *Augusta* in April 1942, and the improved SG-1 entered service in May 1943. The SG radar was placed first on the top of the foremast and then a second set on the main mast; two sets gave 360-degree coverage. Theoretical maximum range was 22nm against a large surface target.

In addition to air and surface search radar, heavy cruisers were fitted with dedicated fire-control radars. For example, the most modern fire-control director, the Mk 34, first received the Mk 3 radar. Mid-war, the Mk 8 was fitted, which had a reliable range of 40,000yd against a large surface target. This was replaced by Mk 13. The Mk 33 director for the 5in battery was first equipped with the Mk 4, which was very successful, and then later the Mk 28 radar.

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PENSACOLA CLASS

Design and Construction

The Pensacola class was begun after other contemporary treaty cruisers, but overall the design did not compare well with other foreign rivals. The primary design consideration was to mount a heavy armament, and this had to match Japanese ships, which were known to carry ten 8in guns. Unlike Japanese heavy cruisers, which carried their ten 8in guns in five turrets, the Pensacola class matched this on only four turrets. This avoided the problem of having a turret with a much reduced arc of fire, and meant that the hull could be shorter, which was a significant weight-saving measure. Because the ship had to fit within treaty limitations, saving weight was a primary design factor. Another weight-saving measure was to provide less protection and less powerful machinery. This meant that the Pensacola class was not as well armored and had a slightly slower maximum speed than the Japanese first-generation treaty cruisers of the Myoko class.

Another weight-saving feature was a flush deck hull and a low freeboard. The designers relied on a pronounced flare and sheer to keep the ships dry. Their two tripod masts and large fighting tops gave them a top-heavy appearance; in fact, they *were* top-heavy, and prone to roll heavily even in moderate seas. This roll affected the fire-control equipment and thus gunnery accuracy.

For their scouting role, speed was another important consideration. Two widely spaced stacks were fitted. The machinery developed a total of 107,000 shaft horsepower (SHP) and consisted of eight boilers connected to four geared turbines, which drove four shafts. Maximum speed was a respectable 32.5kt.

Every treaty cruiser design struggled to combine a balance of firepower, speed, and protection. For the Pensacola class, the first two were achieved at the expense of the latter. Protection accounted for only 6 percent of the total design weight, giving a clear indication that armor was relatively sparse. The main belt was only 3in thick over the machinery spaces and 4in over the forward magazines, with the belt extending 5ft below the waterline. No armor covered the aft magazine because it was bizarrely assumed that any action would occur forward of the beam. The main armored deck was 1in and augmented to 1.75in over the magazines. The 8in mounts were more gunhouses than armored turrets with 2.5in of frontal armor, 1.5in on the sides, and .75in on the rear. Turret barbettes received only .75in. The conning tower was protected by 1.25in of armor. In comparison, the IJN's first-generation treaty cruiser had just over 16 percent of displacement dedicated to protection.

Since heavy cruisers were thought to be primarily scouting platforms, it was deemed very important to carry aircraft. On the Pensacola class, two catapults were fitted port and starboard just aft of the forward stack. In the space between the two stacks, four aircraft could be stored. No hangar was provided.

This view of *Pensacola* was taken shortly after her completion. Note the torpedoes are still fitted amidships under the floatplanes, which are stored in the same area. The unusual arrangement of the main battery is also evident, with the triple mount placed above the twin mount. (NHHC)

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This is a pre-war view of *Salt Lake City* taken in the 1930s, before her first major modification. As completed, she carried two triple banks of torpedoes (the starboard bank is visible on the main deck between the two stacks) and only four 5in guns. (NARA)

Unlike the Japanese, who continually underestimated the weight of the treaty cruisers, took no corrective actions, and therefore produced ships well over 10,000t, the American designers were so successful in saving weight that the Pensacolas came in at only 9,100t. All considered, however, this was not a successful design and was inferior to the first-generation Japanese treaty heavy cruisers. The USN admitted as much by only building only two ships before moving to an improved design.

Pensacola Class Construction				
Ship	**Built at**	**Laid down**	**Launched**	**Commissioned**
Pensacola (CA-24)	New York Naval Yard	27/10/1926	25/04/1929	6/2/1930
Salt Lake City (CA-25)	New York Shipbuilding	9/6/1927	23/1/1929	11/12/1929

Pensacola Class Specifications (as built)	
Displacement	9,097t standard displacement; 11,512t full load
Dimensions	Length 585ft 8in overall; Beam 65ft 3in; Draft 19ft 6in
Speed	32.5kt
Range	10,000nm at 15kt
Crew	631

Pensacola, taken soon after completion in early 1930. The two ships of this class are easily identified by their four 8in gunhouses and their two large masts. (NARA)

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Armament

The Pensacola class featured an unusual ten-gun main battery arrangement, in which a pair of twin and triple mounts were fitted forward and aft. The heavier triple mount was placed in a superfiring position over the twin mount. Placing the triple mounts this high on the ship, necessary because the barbette of the triple mounts could not be placed on the sleek hull, contributed to the top-heavy problem of the class. This made the Pensacola class the only class of USN heavy cruiser to carry ten 8in guns.

The Pensacola class was fitted with two triple-torpedo mounts placed on the upper deck abreast the aft stack. The secondary armament was restricted to four 5in/25 single mounts. A battery of eight 5in guns was deemed necessary for effective antiaircraft protection, but only four mounts were fitted to save weight. Light antiaircraft weaponry was restricted to machine guns.

Service Modifications

Before the war, both ships received major modifications. By 1935, the torpedo mounts were removed from both ships. In their place, four additional 5in/25 single mounts were added abreast the bridge structure. Also just before the war, 1.1in quad mounts began to enter service, and each ship received two.

After the war began, all heavy cruisers received modifications focused on improving their antiaircraft and radar fits. To compensate for this, measures were also taken to reduce top weight. In 1942, antiaircraft fit was increased to four 1.1in quads and eight single 20mm guns. By 1943, the 1.1in mounts were replaced by the more reliable and powerful quad 40mm mounts, and additional 20mm single mounts were added. To compensate, the mainmast was removed, the aircraft complement was reduced to two, and the starboard catapult was detached.

In 1945, *Pensacola* was thoroughly modernized and received a final fit of seven quad 40mm mounts and nine twin 20mm mounts. *Salt Lake City*'s final fit in 1945 was six quad 40mm and 19 single 20mm mounts.

Pensacola was one of the first ships to receive the CXAM radar in 1940. By the end of the war both ships were fitted with an SK radar, two SGs, and the SP aircraft control radar.

Wartime Service

Despite the design deficiencies of these ships, both were employed actively and enjoyed successful careers. When war broke out in the Pacific, *Pensacola* was escorting a convoy to the Philippines. She quickly returned to Pearl Harbor and was assigned to escort carrier *Lexington*, and saw her first action in an abortive raid on Rabaul on February 20, 1942. In March, she participated in the carrier raids on Lae and Salamaua in New Guinea. In June, *Pensacola* participated in the battle of Midway as part of carrier *Enterprise*'s screen. The cruiser was shifted to screen carrier *Yorktown* and engaged Japanese torpedo aircraft when they attacked the damaged carrier. *Pensacola* remained on carrier duty and, in October 1942, escorted carrier *Hornet* at the battle of Santa Cruz; *Hornet* was sunk, but *Pensacola* was undamaged. The following month, *Pensacola* was again assigned to escort *Enterprise* as the Americans turned back the last major Japanese effort to recapture Guadalcanal in the Solomons.

In late November, *Pensacola* and three other heavy cruisers were given the mission to prevent Japanese resupply to Guadalcanal. On the night

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This is a view of *Pensacola* in August 1945, showing the cruiser in her late-war configuration. Both tripod masts have been removed and replaced with much smaller pole masts. Another weight-saving measure was to reduce the size of the fore and aft superstructures. The antiaircraft fit has been greatly expanded with an array of 40mm and 20mm mounts. (NARA)

of November 29–30, the USN force engaged a Japanese destroyer force attempting to land supplies. The resulting action, known as the battle of Tassafaronga, was the most dramatic demonstration of the power of the Japanese Type 93 torpedo during the war. All four of the American heavy cruisers present were torpedoed. A single weapon hit *Pensacola* on the port side below the mainmast and caused major damage. With one engine room flooded, much of the ship lost power, but the primary damage was caused by a fire that raged until noon the following day. The crew saved the ship, but casualties were very heavy, with 125 killed and another 68 wounded.

Repairs kept the cruiser out of the war for a year. When she returned to service in November 1943, she was again assigned to carrier duty. *Pensacola* took part in the Gilbert and Marshall islands campaigns. From May to early August, *Pensacola* was active in the waters of the northern Pacific, shelling targets on the Kurile Islands. Returning to carrier duty, she pounded targets on Wake and Marcus islands. *Pensacola* was part of the Third Fleet throughout the Philippines campaign.

In February 1945, *Pensacola* took part in softening operations against Iwo Jima. On February 17, the cruiser took six hits from Japanese shore

A

THE PENSACOLA CLASS

The top view shows *Pensacola* in her early war configuration as she appeared at Midway in June 1942. Clearly visible are the four 8in gunhouses, making this the only class to carry its main armament in this arrangement. The 5in battery is situated in two groups, one near the forward superstructure and the other abaft the aft stack. Note the significant allocation of space amidships for the aircraft-handling facilities. The ship carries a CXAM radar on the foremast. *Pensacola* is in the Measure (Ms) 21 (navy blue system) scheme. This was an antiaircraft concealment scheme introduced in 1942 and used until the end of the war. The use of solid colors (in this case navy blue and deck blue) was designed to reduce the ship's observability from the air. The second and third views are of *Salt Lake City*, showing her 1944 appearance. The ship's main and secondary armament remains unchanged, but almost everything else has been altered. Both the forward and aft superstructures have been reduced to save top weight. An SK radar is fitted on top of the lowered foremast, and a SP radar on the new polemast aft. There is also a profusion of antiaircraft guns with six 40mm quad mounts and 19 20mm single guns being visible. The ship is in striking Ms 32/14d dazzle scheme. The two basic types of camouflage measures were solid (like Ms 21) and dazzle. A dazzle camouflage was intended to provide antisubmarine protection by causing target angle confusion at close ranges. M2 32 was regarded as the best of the antisubmarine schemes.

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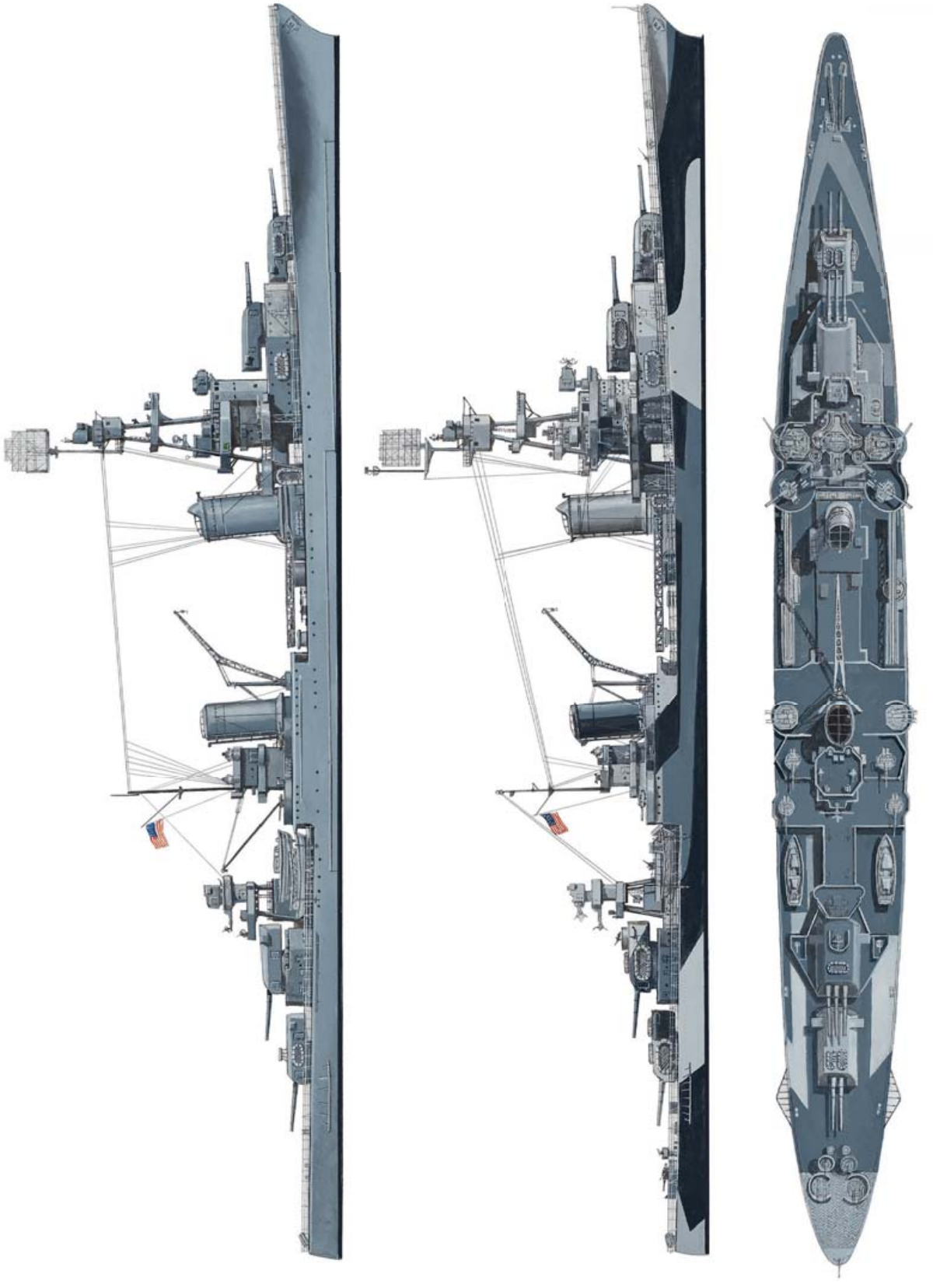

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By June 1944, *Salt Lake City* had been extensively modified. The foremast remains intact, but the mainmast has been cut down. Note the aircraft crane amidships. (*Ships of the World*)

batteries that killed 17 and wounded 119. Beginning in late March until April 15, *Pensacola* supported the invasion of Okinawa by providing gunfire support. Her war service earned 13 Battle Stars.

After the war, it was decided to use *Pensacola* in a series of atomic bomb tests in 1946. In the first test on July 1, the ship was heavily damaged but did not sink. A second test conducted on July 25 caused further damage, but the ship survived. After radiological studies on the ship, she was sunk as a target off the coast of Washington on November 10, 1948.

The start of the war found *Salt Lake City* assigned to the *Enterprise* task group. She accompanied *Enterprise* in the Marshalls raid in February 1942, during which the cruiser conducted shore bombardments and fought off Japanese air attack. In April, she participated in the Doolittle raid against the Japanese home islands.

In August, *Salt Lake City* began operations in support of the landings on Guadalcanal. In October, the Americans decided to contest the nighttime waters around the island following the defeat at Savo Island in August. On the night of October 11–12, *Salt Lake City* was part of an American task force of four cruisers and five destroyers that engaged a smaller Japanese force intent on shelling the key airfield on the island, which was held by the Americans. In the battle of Cape Esperance, the Americans sank a Japanese heavy cruiser and a destroyer, while losing only one destroyer. *Salt Lake City* was hit by three 8in shells in the fray, which penetrated her main belt, and suffered five killed. The damage required six months to repair.

Upon returning to service in March 1943, *Salt Lake City* headed north to patrol the Aleutians. On March 27, at the battle of the Kommandorski Islands, *Salt Lake City* fought one of the epic cruiser battles of the war. An American force of one heavy and one old light cruiser and four destroyers

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intercepted a larger Japanese force of two heavy cruisers, two light cruisers, and five destroyers, which was escorting a supply convoy to Japanese-held islands in the Aleutians. For over three hours, the *Salt Lake City* engaged the two more powerful Japanese heavy cruisers. She fired 832 8in rounds and in return took at least two hits, which caused flooding and a temporary loss of power. Just as it seemed that the Japanese would close for the kill, they broke off the action. The action was a tactical defeat, but a strategic victory since the supply convoy did not reach its destination.

After repairs, *Salt Lake City* joined *Pensacola* on carrier escort duty and participated in the same actions as her sister ship. For her war service she was awarded 11 Battle Stars and an American Navy Unit Commendation for her role in the battle of the Kommandorskis. She was also selected as an atomic test target, and survived both tests. The cruiser was sunk as a target off California on May 25, 1948.

NORTHAMPTON CLASS

Design and Construction

Design work in what was to become the Northampton class began immediately after the Pensacola design was finalized. For the second class of USN treaty cruiser, the designers intended to incorporate a number of improvements in the areas of seaworthiness, survivability and aircraft-handling arrangements. The six ships in the class were authorized in 1924, but not funded until 1927, and were finally laid down in 1928.

The new class was provided with a raised forecastle and increased freeboard. The added length, some 14ft, also improved seakeeping. Nevertheless, excessive rolling was still a problem and bilge keels were fitted. The ships still remained lively in any kind of sea, and this affected gunnery accuracy.

It was becoming apparent to the USN that the Pensacola class came in under weight. The obvious answer was to use this margin to provide extra armor to increase the inadequate level of protection for the Northampton class. The ideal protection scheme would have provided protection against

This is *Pensacola* after being torpedoed at the battle of Tassafaronga, pictured at Espirito Santo on September 17, 1942. The torpedo hit abreast the mainmast where damage is still evident, as is the aftermath from the extensive fire aft. *Pensacola* survived the damage from the 1,078lb warhead of the Imperial Navy's Type 93 torpedo and returned to service in 1943. (NHHC)

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This view of *Northampton* was taken shortly after her completion in 1930. The primary difference between this class and the preceding Pensacola class, the absence of the fourth 8in gunhouse aft, can be seen readily. Note this early configuration included only four 5in guns and a bank of torpedo tubes, which can be seen abaft the rear stack. (NARA)

8in shellfire from opposing enemy cruisers, but this was impossible on a 10,000t ship. After several schemes were considered, it was decided to improve the splinter protection to the magazine up to the turrets and keep the remainder of the extra weight as a design reserve. In spite of this, the final design came in at almost 1,000t under the treaty limit.

Protection amounted to only 3in of armor in the main belt, extending 5ft below the waterline. Deck armor was 1in thick. Magazine protection was increased to 3.75in on the side and 2in overhead. The 8in gunhouses had 2.5in on the front plate and 2in on the roof. Total weight of armor was 1,057t.

Compartmentation was improved with the two large boiler rooms being divided into four smaller rooms. The same machinery was fitted as on the Pensacola class, and top speed remained at 32.5kt.

Aircraft facilities were much improved with a hangar being built in the area of the aft stack that could accommodate four aircraft. The large hangar meant that aircraft were no longer stored and worked on in the open and they gained some measure of blast protection from the ship's main armament. Another two aircraft could be stored on the two catapults, but in practice only four aircraft were carried.

The six ships were all envisioned as flagships. The last three ships had the raised forecastle deck extended aft near the catapults, which allowed for extra accommodation spaces and suitability as a fleet flagship. The other three ships were intended to be used as squadron flagships.

B

THE NORTHAMPTON CLASS

The top two profiles show an early war Northampton-class ship, in this case the lead ship of the class, *Northampton*. This is how the ship appeared during the battle of Midway. The primary differences between *Northampton* and the earlier Pensacola class are the presence of only three 8in gunhouses and the more compact placement of the 5in battery. *Northampton* carries the CXAM-1 radar on her foremast. The ship is in the Ms 21 scheme. *Louisville* (bottom profile) presents a much different appearance in this October 1944 view, as she appeared during the battle of Leyte Gulf. The forward superstructure has been reduced and an SK radar is fitted on the foremast. The mainmast has been entirely removed and a new lattice mast built around the aft stack. The modified area aft now contains many single 20mm mounts. Note the heavy 40mm armament with four quad and four twin mounts. The ship is in the Ms 32/6D scheme.

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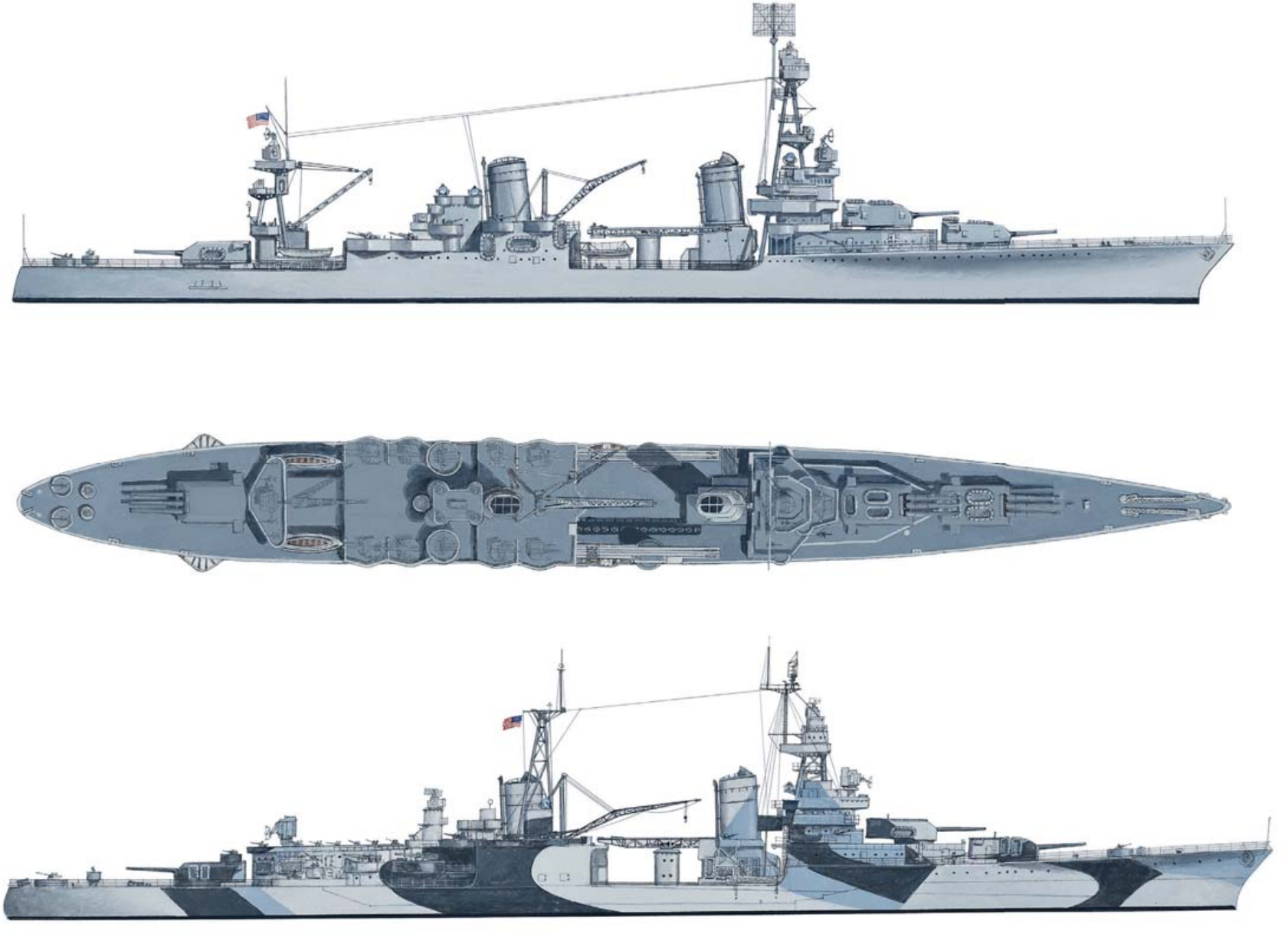

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This April 1935 view of *Houston* shows a Northampton-class cruiser in its pre-war configuration. The class is easily recognized by its two large tripod masts and widely spaced stacks. Beyond *Houston* is a New Orleans-class cruiser that can be identified by its two pole masts and tightly spaced stacks. (NHHC)

Northampton Class Construction				
Ship	**Built at**	**Laid down**	**Launched**	**Commissioned**
Northampton (CA-26)	Bethlehem, Quincy Mass.	12/4/1928	5/9/1929	17/5/1930
Chester (CA-27)	New York Shipbuilding	6/3/1928	3/7/1929	24/6/1930
Louisville (CA-28)	Puget Sound Navy Yard	4/7/1928	1/9/1930	15/1/1931
Chicago (CA-29)	Mare Island Navy Yard	10/9/1928	10/4/1930	9/3/1931
Houston (CA-30)	Newport News	1/5/1928	7/9/1929	17/6/1930
Augusta (CA-31)	Newport News	2/7/1928	1/2/1930	30/1/1931

This early 1930s starboard bow view of *Augusta* shows the ship's hull form. The rows of portholes show that these areas were not armored; in fact, the armored belt covered only the area around the machinery spaces and a small area on the waterline around the forward magazine. (NARA)

Northampton Class Specifications (as built)	
Displacement	9,006t standard displacement; 11,420t full load
Dimensions	Length 600ft 3in overall; Beam 66ft 1in; Draft 19ft 5in
Speed	32.5kt
Range	10,000nm at 15kt
Crew	617

Armament

The ten-gun main battery of the Pensacola class was not repeated. During the design phase, there was considerable debate whether to adopt an eight-gun arrangement as on European heavy cruisers or to move to a nine-gun arrangement with three triple turrets. The triple-turret arrangement was adopted, which allowed the hull to be shorter, with only three turrets as opposed to four. This adoption of a nine-gun main battery proved successful and

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was the preferred arrangement for every other USN heavy cruiser ever built. Otherwise, the armament was the same as the Pensacola class, with an identical torpedo battery and an inadequate secondary battery of four 5in/25 guns. The only light weapons were a few .50-cal machine guns.

Service Modifications

As on the Pensacola-class ships, the torpedo tubes were removed by 1935 and before the war an additional four single 5in/25 guns were fitted. Because of the shortage of the new 1.1in quad mount, four 3in/50 single guns were substituted instead. The mounts were fitted in pairs, one abreast the bridge and the other between the two groups of 5in/25 guns. When she was lost, *Houston* may have had three 3in/50 guns and a single 1.1in quadruple mount. The shortage of guns meant that there was no standard fit for the six Northampton-class ships. The eight Browning .5in/50 machine guns fitted in 1933 were replaced as soon as possible after the start of the war with 20mm guns.

Wartime Modifications to Northampton-Class Cruisers

	1.1in quad mounts	20mm guns	40mm guns	Radar*
Northampton (11/42)	4	14 single	0	CXAM-1
Chester (8/42)	2	13 single	0	CXAM
(6/44)	0	22 single	5 quad	SK, 2 SG
(5/45)	0	13 twin	5 quad, 4 twin	SK, SP, 2 SG
Louisville (11/42)	4	15 single	0	SC
(11/43)	0	24 single	4 quad, 4 twin	SK, 2 SG
(4/45)	0	13 twin	5 quad, 4 twin	SK, SP, 2 SG
Chicago (1/43)	4	20	0	CXAM
Houston (2/42)	1 (+ 3 3in)	0 (8 MGs)	0	none
Augusta (8/45)	0	20	4 quad, 2 twin	SK, 2 SG

* Does not include fire-control radars

The table shows the typical progression in enhancing the antiaircraft fit. In 1942, the 3in/50 single mounts were replaced with four 1.1in quad mounts and the machine guns were replaced with 20mm single guns. This was the

LEFT This aerial oblique of *Chicago* taken early in her career shows the fineness of her hull, which contributed to her high speed. This, and the provision of extensive aircraft-handling facilities (seen here between the stacks), made her well suited for her primary design function – scouting for the battle fleet. (NARA)

RIGHT This 1930s view of *Augusta* shows the aircraft-handling arrangements, which took the entire space between the two stacks. (NARA)

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Chicago, pictured in April 1940. This view shows her aircraft-handling facilities between the two stacks. Stowage was available for four aircraft in the hangar and two more on the catapults, but only four were normally carried. (NHHC)

basic configuration that *Northampton*, *Chicago* and *Houston* exhibited when they were lost. In 1943, the 40mm quad mounts replaced the 1.1in mounts and the number of 20mm guns was increased. As the air threat increased in the form of kamikazes, the final antiaircraft fit was further increased to four quad and two twin 40mm mounts, and up to 13 twin 20mm mounts.

For the three surviving ships, their appearance was changed by reducing the size of the aft superstructure to decrease top weight. By 1945, *Chester* had her large foremast removed and replaced by a polemast for the SK radar. Her mainmast aft was also removed and replaced by a tripod mast built around the aft stack, which was used to place an SP radar. By 1945, *Louisville* had a half mast forward and a new lattice mast aft. The original mainmast was removed. *Augusta* also exhibited a similar late-war appearance with a new lattice mast aft. All ships had the lower deck portholes welded over and the top of the stack modified to keep smoke away from the bridge. One catapult was also removed to save top weight.

This fine view of *Augusta* shows her main battery trained to engage a target to starboard. The three triple mounts became the standard for all future American heavy cruiser designs. (NARA)

This May 1945 view of *Louisville* shows a Northampton-class cruiser in its late-war configuration. The ship retains its main and secondary battery arrangements and widely spaced stacks, but everything else has changed. Both the forward and aft superstructures have been extensively reduced, and both tripod masts are gone. In their place is a lighter pole mast abaft the forward superstructure and a new tower built around the aft stack. The enhanced antiaircraft gun fit is visible with five 40mm quad mounts, four 40mm twin mounts (all located aft), and 13 twin 20mm guns, most mounted aft. (*Ships of the World*)

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Wartime Service

The six ships of the Northampton class gave tremendous service in a variety of roles. Three of the ships were sunk, two solely by torpedoes, and another was struck by a torpedo and survived.

Northampton began the war assigned to the *Enterprise* task group and stayed with the carrier for most of her wartime career. The heavy cruiser bombarded Wotje Island on February 1 and Wake Island on February 24, 1942. In April, she participated in the Doolittle raid. The cruiser remained with *Enterprise* at the battle of Midway. Assigned to escort carrier *Hornet* at Santa Cruz, the cruiser unsuccessfully tried to tow the crippled carrier to safety. She later rejoined the screen of *Enterprise* in November. *Northampton* was one of four USN heavy cruisers torpedoed at Tassafaronga on November 30, but she was the only one to sink. *Northampton* took two torpedoes on her port side and sank within three hours from uncontrolled flooding. Casualties included 49 killed and 29 wounded. For her wartime service, the ship was awarded six Battle Stars.

Chester in May 1945 also in her late-war configuration. She exhibits all the modifications already discussed for *Louisville*. Her 1945 radar fit is visible with an SK and SG radar on the new forward pole mast and an SP radar on the tower built around the aft stack. The Mk 34 main directors both have a cylinder-shaped Mk 13 radar fitted on top of them. The other two prominent devices are Mk 33 fire-control directors used for the secondary battery, each equipped with the Mk 28 radar. (*Ships of the World*)

Chester also began the war as part of the *Enterprise* task group. On the February raid in the Marshalls, *Chester* shelled targets on Taroa Island but was hit by a Japanese aircraft bomb that killed eight crewmembers. She was present at Coral Sea, but missed Midway while in overhaul. Shortly after arriving in the South Pacific, the cruiser was torpedoed on October 20 by Japanese submarine *I-176* southeast of Guadalcanal. A single torpedo hit on the starboard side amidships, causing heavy damage and killing 11. The cruiser survived, but missed a year of the war. Returning to service, *Chester* took part in the invasion of the Marshalls. In June, she shelled targets in the Kuriles and then joined the Third Fleet for the invasion of the Philippines. She was present for the invasion of Iwo Jima in early 1945, but missed the Okinawa campaign as she was in overhaul. The ship was placed in reserve in July 1946 and sold for scrap in August 1959. For her wartime service, the ship was awarded 11 Battle Stars.

Northampton, attempting to tow carrier *Hornet* on October 26 during the battle of Santa Cruz. *Northampton* was one of the first cruisers to receive radar; note the large CXAM set on top of the mainmast. Treaty cruisers spent the majority of their early war careers assigned to carrier escort duties. (*Ships of the World*)

For her sustained service during the war, *Louisville* earned 13 Battle Stars. Her first action came when she escorted *Yorktown* in the February 1942 raids against the Gilberts and Marshalls. She missed the battle of Midway because she was assigned as part of the force to defend the Aleutians. She missed almost all of the Guadalcanal campaign, but joined at the end of the struggle to participate in the battle of Rennell Island, during which *Chicago* was sunk. She was struck by an air-launched torpedo during this engagement, but it failed to detonate. This made *Louisville* one of only two treaty heavy cruisers to be involved in the Guadalcanal campaign and not sunk or damaged. For most of the remainder of 1943, the cruiser was active in the

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waters off the Aleutians and participated in the invasions of Kiska and Attu. In 1944, her principal actions included the battle of the Philippine Sea and Leyte Gulf. At Leyte Gulf she was one of the units present at the battle of the Surigao Strait, which was the last major surface battle of the war and the last battle ever between battleships. The ship suffered in 1945. During the invasion of Luzon, the ship was hit by two kamikaze aircraft on January 6, which killed 32 and wounded 56. On June 5, off Okinawa, the ship was again struck by a kamikaze and this time suffered one dead and 59 wounded. The cruiser was placed in reserve in June 1946, and sold for scrap in 1959.

Chicago had a relatively short wartime career. When the war began, she was part of the *Lexington* task group. She accompanied the carrier to the South Pacific and took part in the carrier raids in March and the battle of the Coral Sea in May. During that engagement, she was detached from the carriers and was subjected to air attack and suffered minor strafing damage. She remained in the South Pacific and took part in the initial landing on Guadalcanal on August 7, 1942. Two days later, the Japanese reacted to the invasion by dispatching a cruiser group to attack the landing force. The first large ship they encountered was *Chicago*. In a brief fight, one Japanese torpedo hit the cruiser on her bow, which forced the ship out of the fight and killed two and wounded 21. The cruiser was forced to retreat to the US for repairs and did not return to action until January 1943. Upon her arrival, *Chicago* was assigned to patrol southeast of Guadalcanal in expectation of another Japanese operation to send reinforcements to the island. On the night of January 29, *Chicago*'s group came under Japanese air attack. In a well-executed attack, two torpedoes struck the cruiser and she was brought to a stop. The next day, Japanese torpedo aircraft finished off the cruiser with another four hits. *Chicago* earned three Battle Stars.

TOP This photo of *Chester* early in her career shows the ship's forward batteries. Above the bridge is the fire-control director for the 8in guns, one of two carried to service the main battery. (NARA)

BOTTOM In this photo taken from *Pensacola*, *Chester* conducts a bombardment of Betio Island in the Gilbert Islands in November 1943. As encounters with the Japanese fleet became more and more infrequent, the treaty cruisers were often employed in support of amphibious operations. (NARA)

The ship in the class with the shortest wartime career was *Houston*. In November 1940, she became the flagship of the USN's Asiatic Fleet based in the Philippines. She was still in the Far East when the war opened, and became part of an Allied fleet tasked with defending the Dutch East Indies from invasion. This was a near-hopeless task against overwhelming odds. On February 4, *Houston* was subjected to a bombing attack that hit the cruiser aft, knocking out the aft 8in gunhouse and killing over 50 crewmen. On February 27, the Allied task force, including *Houston* attempted to intercept a Japanese invasion force headed to Java. The resulting battle of the Java Sea saw the Allied task group defeated by a force led by two Japanese heavy cruisers. On the afternoon of February 28, the Allied

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remnants left Batavia to reach Australia by the Sunda Strait. That evening, *Houston* and an Australian light cruiser were spotted by the Japanese in the Sunda Strait and engaged by a superior force led by two heavy cruisers. *Houston* was sunk in the early morning hours of March 1, and of her crew over 700 died and fewer than 300 survived to face the ordeal of Japanese prison camps. For her wartime service, *Houston* was awarded two Battle Stars and the Presidential Unit Citation for her heroic action in the Java Sea.

The wartime history of *Augusta* began before the attack on Pearl Harbor. As flagship of the Asiatic Fleet, she was caught in Shanghai in August 1937 and mistakenly bombed by Chinese aircraft and then hit by a Japanese shell from shore, which killed one crewman and wounded several. In August the following year, while assigned to the Atlantic Fleet, the cruiser took President Roosevelt to meet Prime Minister Churchill at Placentia Bay in Newfoundland for the Atlantic Charter meeting. When the US entered the war, *Augusta* spent her entire career in the European theater, including the invasion of North Africa in November 1942, the invasion of Normandy in June 1944, and the invasion of southern France in August. When President Truman went to the Potsdam Conference in July 1945, he arrived in Europe aboard *Augusta*. The cruiser was placed in reserve in July 1946 and scrapped in 1959. The ship earned three Battle Stars for her wartime service.

TOP This view is of *Louisville* at anchor with much of her crew mustered on deck. The 'E' on her rear stack indicated that the ship's engineering department had received an award for excellence. (NARA)

BOTTOM This view is of *Chicago* on January 30, 1943, after being struck by two torpedoes the day before. The cruiser is obviously down by the stern as a result of flooding in the aft engine room and two boiler rooms. Later in the day, Japanese torpedo bombers returned and hit her with another four torpedoes, which the ship had no chance of surviving. (NHHC)

PORTLAND CLASS

Design and Construction

Because the design of the next class of treaty cruiser was begun before the ships of the preceding class were even running trials, the extent to which the first two classes were underweight was not immediately understood. When this finally sank in, much criticism was leveled against the Pensacolas and Northamptons for being under-protected. They picked up the nickname of tinclads as a result. With as much as 1,000t to work with, the designers of the next generation of treaty cruisers were determined to come up with a better-balanced design.

The desire to modify the design was upset by the existing authorization and funding scheme. In 1929, 15 additional heavy cruisers had been authorized and were planned to be built in three groups of five for the years

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Portland under way in August 1935. The two ships of this class can be distinguished most readily from the preceding Northampton class by their lack of a tripod mainmast aft. (NHHC)

1929 through 1931. The first group was intended to be a repeat of the previous Northampton class, but criticism of the design prompted a move to re-cast it. Because of contractual issues this could be done only with the three ships planned to be built in Navy yards. The other two ships were contracted out to private builders; to re-cast their design at this late stage would have been exorbitantly expensive.

The result was a two-ship class built to a hybrid design combining features of the first generation of treaty cruisers with the upgrades of the planned second generation. The layout of the ship was largely identical to the Northampton class. The ships were 10ft longer, and the major difference in appearance was a shortened foremast and a much smaller mainmast aft. This reduced top-heaviness and therefore contributed to stability. Machinery was identical, with the exception of replacing the White-Forster boilers with others designed by Yarrow.

The design did make improvements in protection. The extra weight was converted to armor and the main belt was increased to 5.75in over the magazines, while remaining 3in over the machinery. The armor on top of the magazines was slightly increased to 2.125in. The deck armor was increased from a paltry 1in on the Northampton class to 2.5in.

As with the final three ships of the Northampton class, both ships of the Portland class were fitted to act as fleet flagships.

C

USS *HOUSTON* AT THE BATTLE OF SUNDA STRAIT

In the aftermath of the battle of Java Sea, during which the Allied force was routed, *Houston* and Australian light cruiser *Perth* departed Batavia on Java and headed west for the Sunda Strait. The cruisers stumbled upon a Japanese invasion convoy, landing troops on west Java late on February 28. The escorting Japanese warships were caught off guard, but soon a force of two heavy cruisers, one light cruiser, and nine destroyers gathered for the kill. A wild melee ensued, during which the Japanese torpedoed some of their own transports lying off Java. Of the 87 torpedoes fired by the Japanese, an estimated three found *Houston*. The cruiser was also pummeled by a large number of shells and sank in the early hours of March 1 with heavy loss of life. The scene shows the height of the action, with *Houston* firing her forward main guns (the aft turret was previously knocked out) while the Japanese barrage all around her intensifies. Though at night, the basic outline of an early war Northampton-class cruiser is evident with three 8in gunhouses and two large masts. The ship is wearing Ms 1 (dark gray scheme), which was a general-purpose measure designed to reduce observation from ships and aircraft.

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This is *Indianapolis* in September 1937. Note the extra plating along the main deck level, back to a point near the catapult. This was done to enclose extra spaces to allow her to act as a flagship. (NHHC)

Portland Class Construction				
Ship	**Built at**	**Laid down**	**Launched**	**Commissioned**
Portland (CA-33)	Bethlehem, Quincy Mass.	17/2/1930	21/5/1932	23/2/1933
Indianapolis (CA-25)	New York Shipbuilding	31/3/1930	7/11/1931	15/11/1932

Portland Class Specifications (as built)	
Displacement	10,258t standard displacement; 12,775t full load
Dimensions	Length 610ft overall; Beam 66ft; Draft 21ft
Speed	32.5kt
Range	10,000nm at 15kt
Crew	807

Armament

The same main battery was used on the Portland class. The torpedo tubes were deleted from the design and were not aboard the ships when they were completed. The standard four-gun 5in/25 secondary battery was increased to eight guns when completed.

Service Modifications

Modifications early in the war centered around strengthening the ships' antiaircraft defenses. In early 1942, four quadruple 1.1in mounts were fitted, as well as 12 single 20mm guns on *Indianapolis* and 17 on *Portland*. In May 1943 both ships underwent further modification. The 1.1in mounts were replaced by 40mm quad mounts. By 1944, *Portland* had four quad and four twin 40mm mounts and 17 20mm guns. *Indianapolis* had six quadruple mounts and 19 20mm single mounts.

The appearance of the ships also changed when, in 1943, the front of the bridge was extended, the size of the aft superstructure reduced, and a lattice tripod mast was built around the aft stack. In an attempt to reduce top weight, the starboard catapult was removed in both ships. Aircraft capacity

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was reduced to two on *Portland* and three on *Indianapolis*.

In May 1944, *Indianapolis* emerged from an overhaul with four quad 40mm and two twin 40mm mounts, 19 single 20mm, and an SK radar in a new mast built around the aft stack, which was unique to this ship. *Indianapolis* underwent a final modernization in mid-July 1945; when the cruiser was sunk the same year, she was carrying six 40mm quad mounts and eight twin 20mm mounts.

Indianapolis, pictured in May 1943 in her mid-war configuration. Note the mainmast has been removed and a tripod built around the aft stack to mount the SK radar. Barely visible are the SG antennae on both the foremast and the new tripod. The forward superstructure has been reduced and a growing profusion of antiaircraft guns is becoming evident. (*Ships of the World*)

Wartime Service

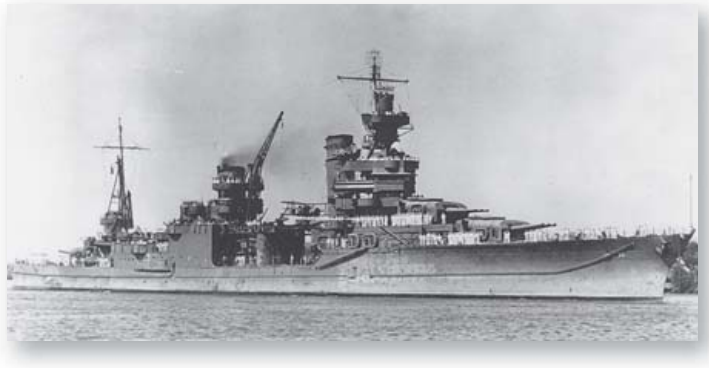
Both these ships had active careers, all of which were spent in the Pacific. *Indianapolis* achieved a certain degree of notoriety by being the last major American ship sunk during the war.

Portland began the war assigned to the *Lexington* task group and remained with the carrier up until Coral Sea. At Midway, she was assigned to escort *Yorktown*. Going into the Guadalcanal campaign, *Portland* remained on carrier duty and participated in the battle of the Eastern Solomons in August as part of the *Enterprise* task group. During the second carrier battle of the campaign at Santa Cruz in October, *Portland* remained with *Enterprise*.

The following month, *Portland* was committed to the desperate surface battles around Guadalcanal. She played an important role in the first naval battle of Guadalcanal on the night of November 12–13. As one of two American heavy cruisers present, she selected Japanese battleship *Hiei* for treatment and pummeled her with 8in gunfire. Minutes later, a Japanese destroyer gained a torpedo solution against *Portland* and struck her with a single torpedo aft, which destroyed the two starboard shafts and jammed the rudder in a starboard turn. The next morning the crippled cruiser was still circling, but she was able to engage the destroyer responsible for torpedoing her and sank her with six 8in salvoes.

Portland returned to the United States for repairs that took until March 1943. Upon her return she joined the Fast Carrier Force and took part in the invasion of the Gilbert and Marshall islands in late 1943 and the landing at Hollandia, New Guinea, in early 1944. In September 1944, she supported the landings on Peleliu and, in October, was present at the battle of Surigao Strait. Into 1945, the cruiser participated in the invasion of Luzon, and then the invasion of Okinawa. At the conclusion of the war, she was used as the flagship for the American forces accepting the surrender of Japanese forces at Truk Atoll in the Central Pacific. Her extensive wartime service earned her 16 Battle Stars and a Navy Unit Commendation.

Portland returning to Pearl Harbor on June 14, 1942, after the battle of Midway. Aside from her dark Ms 21 scheme, the ship is little changed from the start of the war. One major difference was the addition of radar; the SC radar is visible in the foremast. (NHHC)



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This view of *Portland* was taken immediately after the war and shows the ship in her late-war configuration. The SK radar has been fitted on the foremast, but the platform on the tower built around the aft stack remains vacant. The ship's 40mm fit has been increased to four quad and four twin mounts, as is evident in this photo. (NARA)

The cruiser was placed into reserve in 1946, and scrapped in 1959.

The opening of hostilities found *Indianapolis* escorting carriers. Her early war career was unusual for a Pacific Fleet cruiser in that she did not take part in Coral Sea, Midway, or the Guadalcanal campaign. After a refit, she rejoined the fleet in July 1942 and spent most of her time in the Aleutians until the summer of 1943, when she was again sent into refit. When she was returned to service, she was assigned as the flagship of the Fifth Fleet. In this capacity, she participated in the invasions of the Gilberts and Marshalls, and the battle of the Philippine Sea. After another refit beginning in October 1944, the ship returned for the invasion of Iwo Jima and was preparing for the landing on Okinawa when she was struck by a single kamikaze on March 31, 1945. Nine men were killed, and the damage was severe enough to force a return to the United States for hull repairs. This meant that, when repairs were completed in July, she was assigned to carry the uranium core of the atomic bomb dropped on Hiroshima to Tainan in the Marianas. This was accomplished in record time (5,000nm in ten days), but when the ship was ordered to Leyte, she encountered Japanese submarine *I-58*, which slammed two torpedoes into the cruiser early on July 30. These caused catastrophic damage that capsized the cruiser in only 12 minutes. The fate of the crewmen who survived the sinking was tragic, as they spent four days in the water before being found and rescued. Of the 1,196 men aboard, only 316 survived. *Indianapolis* earned ten Battle Stars.

NEW ORLEANS CLASS

Design and Construction

The New Orleans class was the second generation of American treaty cruisers; it was undoubtedly the best USN treaty cruiser and, overall, one of the best-balanced treaty cruisers produced by any nation. The ships were

D

THE PORTLAND CLASS

The top profile is of *Portland* as she appeared during 1942. This shows a typical early war configuration before extensive modifications took place. The ship retains its large foremast, on top of which an SC radar has been fitted. The aft superstructure and mainmast also still remain. The antiaircraft fit has been strengthened and includes a pair of 1.1in quad mounts abreast the bridge and another pair located aft in the middle of the 5in secondary battery. At this point only 12 20mm guns were fitted. The ship is in the Ms 21 scheme. The next two profiles show *Indianapolis* in July 1945, just before her loss to submarine torpedoes. The ship has just received the state-of-the-art antiaircraft modifications, which include an SK radar on the new lattice mast built around the aft stack (note the mainmast has been removed), six 40mm quad mounts, and eight twin 20mm mounts. Much top weight, primarily the forward and aft superstructures, has been removed or reduced to allow these late-war modifications. The arrangement of the main and secondary batteries is unaltered. The ship is the Ms 22 graded system scheme, which was designed to provide antisubmarine and antiaircraft concealment.

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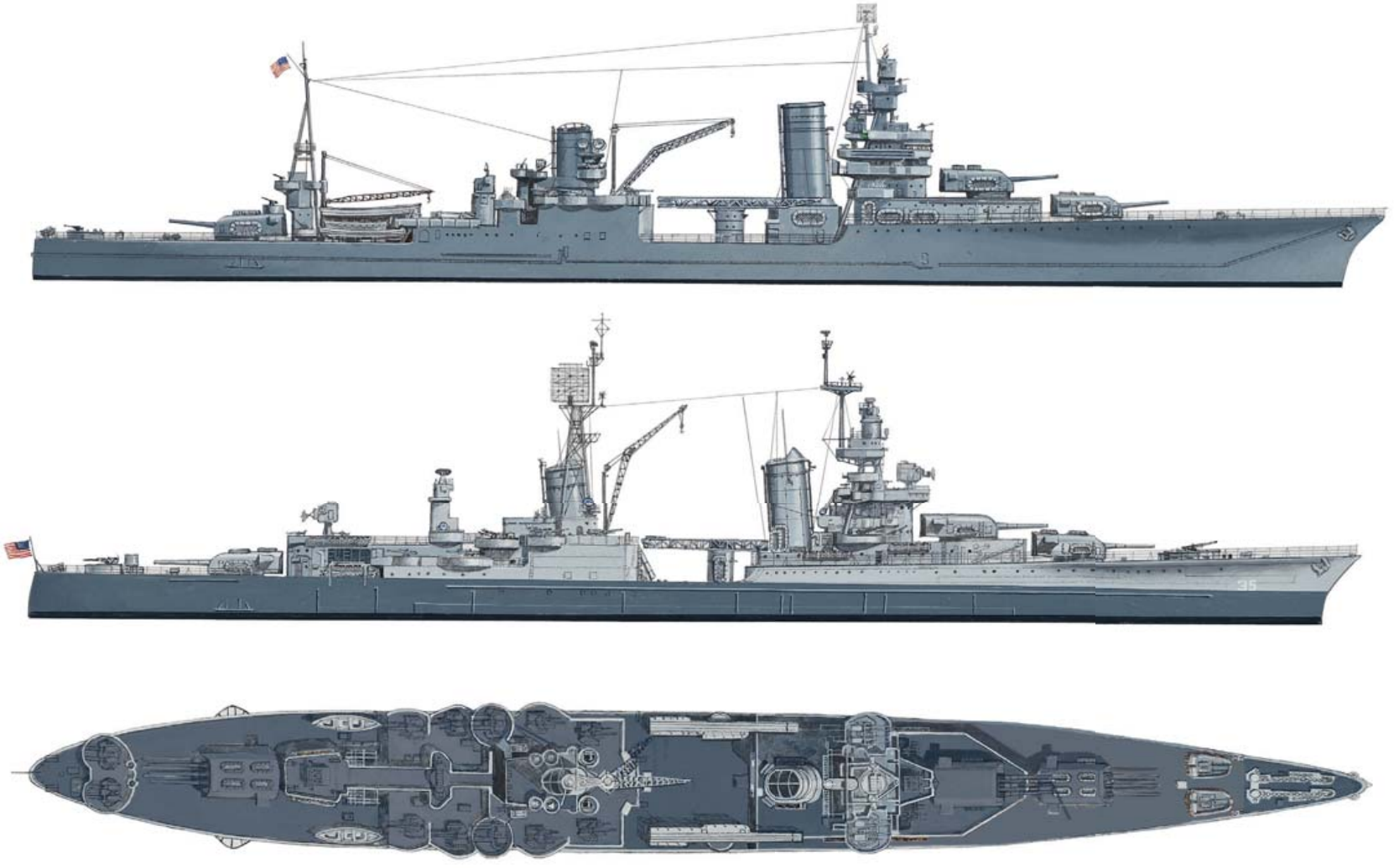

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TOP *New Orleans* photographed before the war. This class was readily distinguished from earlier treaty cruisers by the two stacks placed close together and the position of the aircraft-handling facilities abaft them. The lead ship of the class entered service in early 1934 and constituted a great improvement in American treaty cruiser design. (NARA)

BOTTOM This aerial view of *Minneapolis*' starboard bow shows the placement of the secondary battery and the opening for the aircraft hangar abaft the aft stack. (NARA)

much better designed than the earlier Northamptons because they used the full permitted 10,000t.

Originally it was envisioned that 15 of these ships would be built, but this did not occur because of the parsimony of Congress and the overall tonnage restrictions on heavy cruisers introduced by the London Naval Treaty of 1930. In the end, only seven ships were built. The first three were from the 1929 budget, and the next three were funded in 1930, but the last ship in this group was not started until 1933. The London Naval Treaty prevented the final ship from being started until 1934. Because the construction of these ships was spread out over a number of years, there were actually three sub-groups of ships with slight differences in appearance and armament.

The key difference in this class was the design emphasis placed on protection. This was accomplished by converting the unused 1,000t into armor and also by reducing the hull by 14ft at the waterline compared with the Portland class and the beam by some 4ft. The reduction in the hull length was made possible by adopting a new arrangement in the machinery spaces that reduced the length of each engine room by 4ft. Of the design displacement, 15 percent was used for armor. The shorter hull meant the armor belt was shorter, and this weight saving was converted into additional thickness of the belt. The maximum belt thickness was increased to 5in, tapered to 3in on its lower part. The magazines received another 3–4.7in of additional side protection internally. Deck protection was 2.5in over magazines and 1.125in elsewhere. The turret barbette received 5in of armor and the conning tower 2.5in. The turrets were much more heavily armored and made proof in some areas against 8in gunfire. Turret faces were protected with 8in of armor, 2.75in on the roof, and 1.5in on the sides and rear.

The same machinery was fitted as on the Portland class. The principal difference was that the unit arrangement was not employed, which meant that all boiler rooms were placed together forward of the engine rooms, creating the risk of all propulsive power being destroyed by a single well-placed torpedo. The class also had a reduced bunkerage, which meant that range was reduced to 7,600nm.

The provision of aircraft remained an important consideration. Aircraft arrangements were similar to those on the Portland class. Two catapults were

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Quincy in May 1940, showing the placement of the secondary battery and the aircraft-handling facilities. The portion of the ship between the aft stack and the aft 8in turret was devoted to aircraft handling with the hangar, two cranes, and two catapults all being visible. (NHHC)

fitted, serviced by two cranes, and stowage space was available for four aircraft. Since the two funnels were placed forward, all of the aircraft-handling facilities were abaft the aft stack. These were the best aircraft-handling facilities of any preceding treaty cruiser, since the well deck and the hangar gave ample room for handling and stowage.

There were subtle differences in appearance among the seven ships. The first three ships had the top of their turret face rounded, and the last four featured a flat face. Most different was the signal bridge (located above the navigation bridge), which was open on three ships and covered on the other four. The last two ships built, *Vincennes* and *Quincy*, were of the same appearance, but differed from the rest of the class. They had flat faces on the 8in turrets, their signal bridges were open, and these were the only two ships that had their barbette for turret number two exposed, since the forward turret was moved 9ft back as a cost-saving measure to reduce the length of the armor belt. Another minor difference was the placement of the third and fourth pairs of 5in guns (some were indented, and some were not).

New Orleans Class Construction

Ship	Built at	Laid down	Launched	Commissioned
New Orleans (CA-32)	New York Navy Yard	14/3/1931	12/4/1933	15/2/1934
Astoria (CA-34)	Puget Sound Navy Yard	1/9/1930	16/12/1933	28/4/1934
Minneapolis (CA-36)	Philadelphia Navy Yard	27/6/1931	6/9/1933	19/5/1934
Tuscaloosa (CA-37)	New York Shipbuilding	3/9/1931	15/11/1933	17/8/1934
San Francisco (CA-38)	Mare Island Navy Yard	9/9/1931	9/3/1933	10/2/1934
Quincy (CA-39)	Bethlehem, Quincy Mass.	15/11/1933	19/6/1935	9/6/1936
Vincennes (CA-44)	Bethlehem, Quincy Mass.	2/1/1934	21/5/1936	24/2/1937

New Orleans Class Specifications (as built)	
Displacement	10,136t standard displacement; 12,493t full load
Dimensions	Length 588ft overall; Beam 61ft 9in; Draft 22ft 9in
Speed	32.7kt
Range	7,6000nm at 15kt
Crew	868

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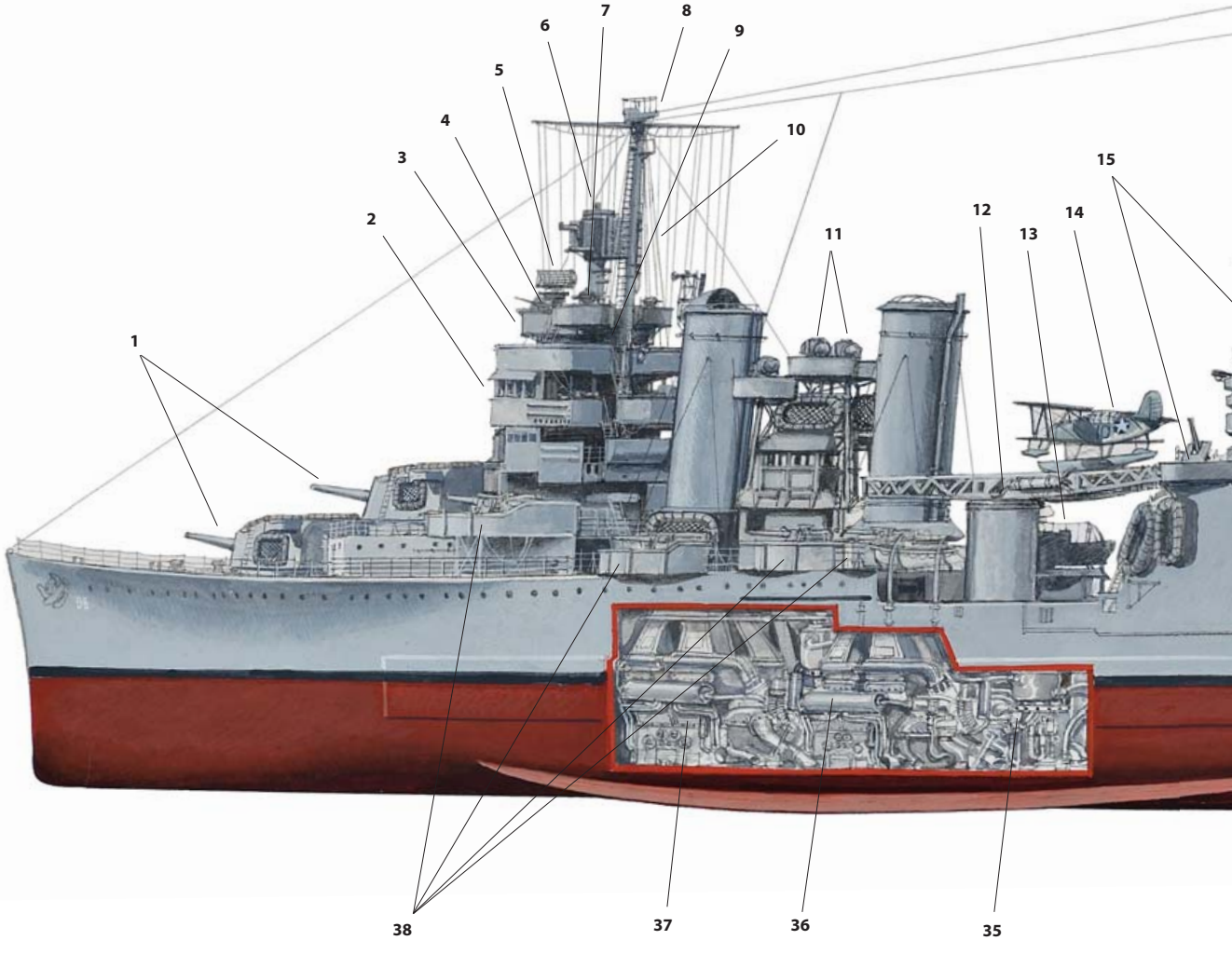
USS SAN FRANCISCO

This is *San Francisco* as she appeared in November 1942, at the time of her being heavily damaged at the first naval battle of Guadalcanal. The cruiser was a member of the New Orleans class, which was the best of the American treaty cruiser designs. The view shows a New Orleans-class cruiser in its early war configuration. The ship presents a much different appearance from earlier classes with the absence of the large tripod masts and the movement of the aircraft-handling facilities to a position abaft the aft stack. The new style of 8in turrets is also evident. The radar fit consists of a single SC radar on the foremast, and the antiaircraft fit is still not heavily augmented, consisting of only four 1.1in quad mounts (located abreast the bridge and on the fantail) and 12 20mm single guns. The ship is in the Ms 11 scheme, which was very similar to the Ms 21 scheme.



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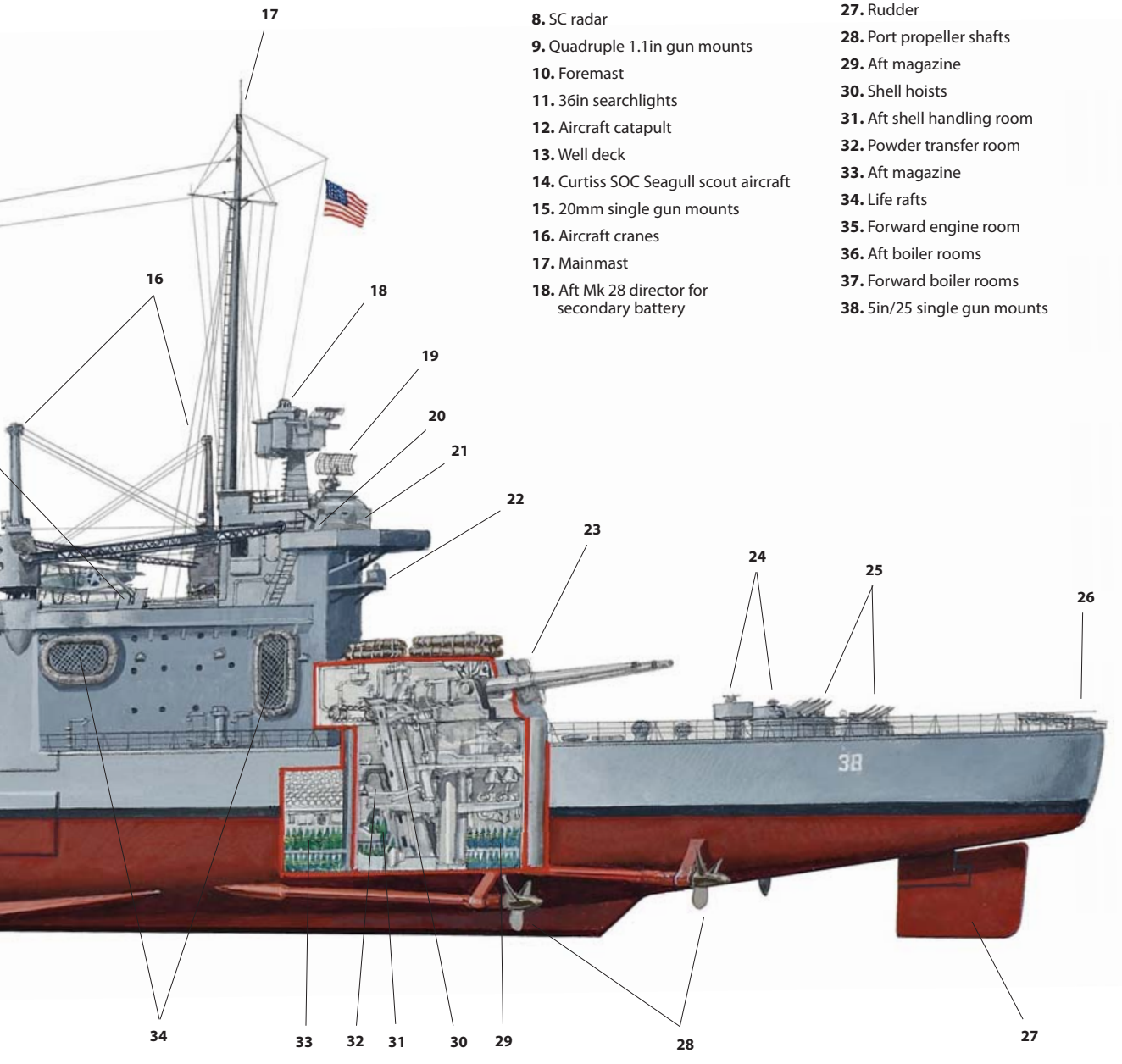
KEY

1. Triple 8in gun turrets
2. Navigation bridge
3. Signal platform
4. Forward Mk 31 director for main battery
5. Mk 3 fire control radar
6. Forward Mk 28 director for secondary battery
7. Mk 44 director
8. SC radar
9. Quadruple 1.1in gun mounts
10. Foremast
11. 36in searchlights
12. Aircraft catapult
13. Well deck
14. Curtiss SOC Seagull scout aircraft
15. 20mm single gun mounts
16. Aircraft cranes
17. Mainmast
18. Aft Mk 28 director for secondary battery
19. Mk 3 fire-control radar
20. 20mm single gun mounts
21. Mk 31 director for main battery
22. 2.5m rangefinder
23. Triple 8in gun turret
24. Mk 44 director
25. Quadruple 1.1in gun mounts
26. Depth charge rack
27. Rudder
28. Port propeller shafts
29. Aft magazine
30. Shell hoists
31. Aft shell handling room
32. Powder transfer room
33. Aft magazine
34. Life rafts
35. Forward engine room
36. Aft boiler rooms
37. Forward boiler rooms
38. 5in/25 single gun mounts



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LEFT *Tuscaloosa* shown just after being commissioned in mid-1934. The higher freeboard and absence of large superstructures and masts made this class more stable than earlier treaty cruisers and allowed a greater percentage of displacement to be devoted to protection. (NARA)

RIGHT This is another view of *Tuscaloosa* taken before the war. The ship is at speed and gives a clean and modern appearance. The New Orleans class was considered to be one of the US Navy's most attractive designs. (NARA)

Armament

The main battery remained nine 8in guns arranged in three triple turrets. The seven ships in the class had three different types of 8in guns. From the onset, they were completed with a secondary battery of eight single 5in/25 guns. Light antiaircraft armament was restricted to eight .50-cal machine guns.

Service Modifications

Prior to the war, the 5in guns were provided with splinter shields. As soon as they were available, each ship received four 1.1in quad mounts. These were mounted in pairs, one set above the navigation bridge and the second on the fantail. This was completed by April 1942. The machine guns were also replaced by single 20mm mounts as soon as possible. By 1942 the prescribed number was 12, and these were placed in groups on the forward superstructure, on top of the hangar, and on the aft superstructure. *Astoria*, *Quincy*, and *Vincennes* were all lost in this configuration.

Three of the surviving four ships had been seriously damaged in the Guadalcanal campaign, so when they returned to the US for repair, they were also modernized. This changed their appearance markedly. Both the forward and aft superstructures were rebuilt. The new superstructures were more compact and lighter, and were slightly different on each of the four ships. This was important since the ships were already at the limit of their weight allowances; any increase in antiaircraft weaponry had to be compensated for

Vincennes in January 1938, passing through the Panama Canal. This was the last of the New Orleans-class cruisers to be completed, but the ship was fated to have a short wartime career. (NHHC)

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LEFT *New Orleans* following her repairs after the battle of Tassafaronga in 1943, showing the ship in its mid-war configuration. The SC radar remains on the foremast, but the antiaircraft fit has been greatly enhanced, as shown by the fitting of two quad 40mm mounts on the quarterdeck. In the background is *Pensacola*. (NARA)

by the removal of other top weight. The new design also gave the new weapons greater arcs of fire. These allowed for a dramatic improvement of the antiaircraft fit in 1943. The 1.1in mounts were replaced by 40mm quad mounts, and another pair was added on top on the hangar, bringing the total to six. The number of single 20mm mounts was also increased; this was accomplished primarily by altering the searchlight tower between the stacks and adding a platform around the aft stack. The table below gives representative fits of the New Orleans-class ships during various points in their wartime careers. Another weight-saving measure was to remove one of the catapults and to reduce the number of aircraft usually embarked to two.

Wartime Modifications to New Orleans-Class Cruisers

	1.1in quad mounts	20mm guns	40mm guns	Radar*
New Orleans (11/42)	4	12 single	0	SC
(4/45)	0	28 single	6 quad	SK, SP, 1 SG
Astoria (8/42)	4	12 single	0	SC
Minneapolis (8/42)	4	12 single	0	SC
(10/43)	0	24 single	6 quad	SK, 2 SG
(6/45)	0	9 twin	6 quad, 1 twin	SK, SP, 2 SG
Tuscaloosa (1/45)	0	16 single	6 quad	SK, 2 SG
San Francisco (5/42)	4	12 single	0	SC
(8/44)	0	26 single	6 quad	SK, 2 SG
Quincy (8/42)	4	12 single	0	SC
Vincennes (8/42)	4	12 single	0	SC

* Does not include fire-control radars

BELOW LEFT *San Francisco* pictured in October 1944, exhibiting the late-war configuration of a New Orleans-class cruiser. The forward superstructure has been modified and the antiaircraft altered in favor of heavier weapons, as shown by the substitution of two 40mm quad mounts on top of the hangar for the previously fitted 20mm single guns. The radar fit includes an SK on the foremast and two SGs, one on each mast. The ship never received the SP radar on the platform on the mainmast.

BELOW This view of *New Orleans* shows the cruiser in July 1943, after it had completed repairs from the battle of Tassafaronga. The forward superstructure has been modified and the antiaircraft fit has been greatly expanded, with two 40mm quad mounts on the quarterdeck and two more abreast the forward superstructure. Positions for the 28 20mm single guns are also evident and are concentrated between the stacks and the aft superstructure. (*Ships of the World*)

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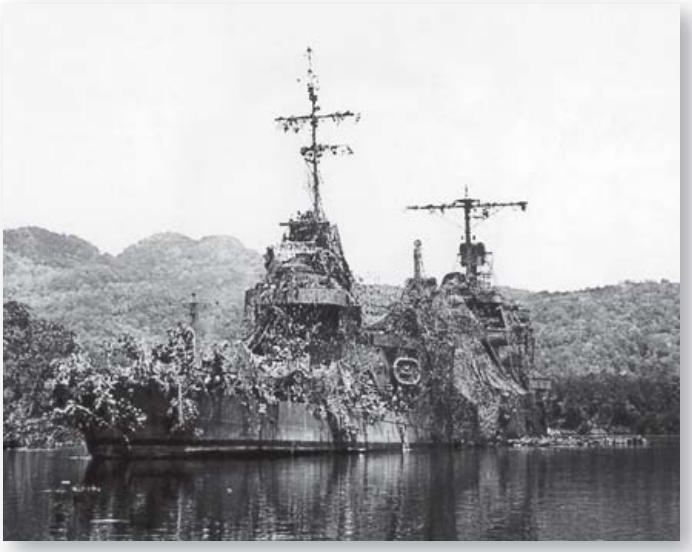

On the night of November 30, 1942, *New Orleans* was one of four treaty cruisers to be torpedoed by Japanese destroyers. This view shows the cruiser camouflaged in Tulagi harbor after losing her bow. If a nearby sanctuary had not been available, the ship would have been lost. (NHHC)

Wartime Service

The seven ships in this class had generally similar careers with the exception of *Tuscaloosa*. The other six were assigned to the Pacific Fleet and were active as carrier escorts in the first months of the war, until all were committed to the intense night battles off Guadalcanal. Three of these ships were sunk in a single night during the opening battle of the campaign, with the remaining three all being damaged later in the campaign. When the three surviving ships returned to service, they again returned to carrier escort duties.

The lead ship, *New Orleans*, had a very active career seeing action in most major battles of the war. The ship was caught in Pearl Harbor during the Japanese attack but was undamaged. Assigned to carrier duty, she was present at both Coral Sea and Midway. She remained with the carriers into the Guadalcanal campaign and escorted *Saratoga* at the battle of the Eastern Solomons. On the night of November 30, she was one of four heavy cruisers torpedoed by Japanese destroyers. *New Orleans* took a single torpedo forward, which destroyed her bow as far back as the second turret (a total of 154ft). Upon returning to service, she rejoined the fast carrier force and participated in the Gilberts and Marshalls campaigns. During the massive raid on Truk in February, *New Orleans* was part of a surface task group deployed to catch Japanese ships escaping the air attack. She engaged and sank a Japanese training cruiser and a destroyer. In June, she was present at the battle of the Philippine Sea. She remained with the carriers at the battle of Leyte Gulf, and was again part of a task group formed to finish off cripples from the air attack. She finished off a light carrier and sank a large destroyer that went down with guns blazing. After a refit, she returned in mid-April 1945 for the Okinawa campaign. Her extensive wartime service earned her 16 Battle Stars. *New Orleans* was placed in reserve in 1947 and sold for scrap in 1959.

Astoria, *Quincy*, and *Vincennes* had very similar fates and will be treated together. All began the war assigned to carrier escort duty. *Astoria* was present at Coral Sea and Midway, and *Vincennes* was also at Midway. On the night of

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***TUSCALOOSA* AT CHERBOURG**

By the time of the Normandy landings in June 1944, only two treaty cruisers remained in the European theater. These ships were active on D-Day and later supported the American attack against the key port of Cherbourg on the Cotentin Peninsula. This scene depicts *Tuscaloosa* conducting a bombardment of German defenses at the port of Cherbourg on June 26, 1944. The cruiser successfully engaged German shore batteries and was not damaged. This view shows the cruiser in her late-war configuration and camouflage. The ship has had its forward superstructure reduced and mounts an SK radar in the foremast. Six 40mm quad mounts have been fitted (one pair abreast the bridge, one pair on top of the hangar, and the last on the fantail) and some 22 20mm single guns are evident. The ship is in the Ms 33/13d scheme, which was a refinement of other dazzle schemes designed to give low-visibility antisubmarine protection.

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Astoria in July 1942 off Hawaii, before deploying to the South Pacific. The ship is in its early war configuration. It has assumed the Ms 21 dark gray scheme. Several 20mm single and four 1.1in mounts are evident. The SC radar is barely visible on the mainmast. (NHHC)

August 8–9, the three were covering the American invasion fleet of Guadalcanal. All were assigned to the Northern Force, which was attacked and surprised by a force of five Japanese heavy and one light cruiser. Within minutes of the opening of the engagement, all three ships were devastated by deadly and accurate 8in gunfire. *Quincy* was the first to sink, following 54 shell hits of various sizes and three torpedoes; 370 crewmen were killed. *Vincennes* was struck by as many as 74 shell hits and two torpedoes, suffering 332 killed. The Japanese cruisers hit *Astoria* with between 34 and 63 shells; 216 died aboard *Astoria*. The only effective reply was delivered by *Quincy* when she hit the bridge of the Japanese flagship with two 8in shells, killing 34.

Minneapolis recorded an outstanding wartime career, earning 17 Battle Stars in the process. She barely missed being present at Pearl Harbor on December 7, 1941. The cruiser was quickly assigned to carrier escort duty, participating in the raids in January and February 1942, and then taking part in the carrier battles of Coral Sea and Midway. The cruiser was also present at Eastern Solomons. The cruiser was one of the targets of Japanese torpedoes at Tassafaronga on November 30. She survived the most damage to any New Orleans-class ship after taking two torpedoes. One blew off the bow up until the forward 8in turret and the other hit aft and flooded a boiler room. Repairs took until September 1943. Upon returning to service, she rejoined the fast carrier force and participated in the Gilberts and Marshalls campaigns. Along with *New Orleans*, *Minneapolis* participated in the February 1944 raid on Truk and assisted in the sinking of a Japanese training cruiser and a destroyer attempting to escape the air onslaught. The cruiser was present at the battle of the Philippine Sea. For the Leyte operation, she was assigned to the 7th Fleet, supporting ground troops with shore bombardments and taking part in the battle of Surigao Strait on October 25. *Minneapolis* remained in the Philippines to take part in the invasion of Luzon in January 1945. In March and April, the cruiser participated in the preliminaries of the Okinawa invasion and the first weeks of the battle. A well-deserved refit meant the ship missed the last months of the war. With the return of peace, *Minneapolis* was placed in reserve in 1947 and then sold for scrap in 1959.

This well-known photo shows *Minneapolis* after being torpedoed on November 30, 1942. Fortunately for the Americans, the torpedo struck well forward, but the damage was still considerable. (NHHC)

San Francisco was the second most decorated ship in USN history after carrier *Enterprise*. Her combat career, spent entirely in the Pacific, earned her 17 Battle Stars and a Presidential Unit Citation. The cruiser was undergoing refit in Pearl Harbor the day the war began, but she survived the raid undamaged. Like most other heavy cruisers she was quickly assigned to carrier escort duty. Sent to the South Pacific, she participated in raids against Rabaul in January and against Japanese invasion forces off New Guinea

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in March. *San Francisco* missed Coral Sea and Midway, but was involved in the Guadalcanal campaign from the onset. The ship was present at the carrier battle of the Eastern Solomons in August, and during the first American surface victory in October at the battle of Cape Esperance. Later in October, she participated in the battle of Santa Cruz, but saw no action. As the campaign entered its decisive phase in November, *San Francisco* was designated as the flagship of a cruiser-destroyer force to stop a Japanese bombardment of the airfield on Guadalcanal by two battleships. In the most fierce and confused night battle of the war, fought at close range, *San Francisco* scored a critical hit on battleship *Hiei*, which wrecked her steering compartment and began a chain of events that led to her loss. *San Francisco* was in the midst of the action and was hit by shells from both sides. At least 45 shells struck the ship, killing her captain, the embarked admiral, and many crewmen. The badly damaged cruiser survived and returned to the US for repair, which took until February 1943. Upon her return, the cruiser took part in the re-occupation of Attu and Kiska in the Aleutians. By November, *San Francisco* returned to the Central Pacific to take part in the Gilberts and Marshalls campaigns. Throughout 1944, the cruiser remained with the Fast Carrier Force, taking part in the Hollandia operation and then the Philippine Sea action in June. She missed Leyte Gulf because of refit, but returned to take part in the 1945 operations in the Philippines, Iwo Jima, and finally Okinawa. She returned to the US in early 1947 and entered a reserve status before being sold for scrap in 1959.

San Francisco was hit by at least 45 shells during the second naval battle of Guadalcanal, but since her watertight integrity was not threatened, she survived with only moderate damage. This photo shows her entering Pearl Harbor on December 4, 1942, after temporary repairs. (NHHC)

Tuscaloosa was the only New Orleans-class ship to spend the majority of her career in the European theater. The beginning of war found *Tuscaloosa* on Neutrality Patrol in the North Atlantic. From April until September 1942, the cruiser was attached to the British Home Fleet, which included duty on the Arctic convoy route. In November 1942, she was assigned to escort the Casablanca invasion convoy in Operation *Torch* – the Allied invasion of French North Africa. During this operation, she engaged and damaged a French destroyer and dodged French submarine torpedoes. In September 1943, *Tuscaloosa* escorted carrier *Ranger* during strikes on German shipping in Norwegian waters. In June, she provided gunfire support to American forces at Utah Beach during the Normandy invasion. In July, she dueled with German shore batteries off Cherbourg. In August, in her final operation in European waters, *Tuscaloosa* supported the invasion of southern France. Arriving in the Pacific in January 1945, she participated in the invasion of Iwo Jima the following month and then took part in the preliminaries of the Okinawa invasion in March 1945. Her wartime service gained her seven Battle Stars. The cruiser was placed in reserve in 1946 and sold for scrap in 1959.

San Francisco in Korean waters in October 1945. The ship is wearing the Ms 22 graded system. (NARA)

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Wichita, as seen on May 1940 while operating in the Atlantic. This overhead view shows her unique appearance among treaty heavy cruisers. Note the placement of the secondary battery, with four in covered gun mounts and four in open mounts. For the first time on a treaty heavy cruiser, two are on the centerline. The aircraft-handling facilities were moved to the stern, as is evident in this overhead view. (NHHC)

WICHITA CLASS

Design and Construction

Wichita was originally intended as the eighth New Orleans-class ship, but this was altered by the London Naval Treaty. In accordance with the treaty, the final New Orleans-class ship was laid down in 1934. The last of 18 heavy cruisers would be started in 1935, but by that time the USN already had in hand a very successful 10,000t light cruiser design, the Brooklyn class, which was armed with 15 6in guns. In several respects, this was a more advanced design than the treaty heavy cruiser, so it was decided to use the design as the basis for the final USN treaty heavy cruiser. After issues were resolved on fitting the 8in gun battery onto a light cruiser hull, construction was begun in late 1935. The new design featured several important improvements. These included a better secondary battery layout, improved placement of aircraft-handling facilities, a higher freeboard for better seakeeping and greater range created by more bunkerage. The ships were also the best protected of the American treaty cruisers. This ship had the least design margin in terms of overall weight, so excessive topside weight was an issue for her entire life. After sea trials, more ballasting was added to address this issue.

Machinery was comparable to the New Orleans class but with the substitution of Parsons geared turbines. These developed 100,000shp, which was sufficient to propel the ship at a top speed of over 33kt.

Protection was better than that of the New Orleans class. The main belt was 4in on the ends and a maximum of 6in with 2.25in of horizontal protection. The turret barbettes were covered by 7in of armor and the conning tower by 6in.

For the first time on an American cruiser, the aircraft-handling facilities were moved from their customary position amidships to the ship's fantail. This was a major improvement since it removed a major source of battle damage from fire to the less-vulnerable rear of the ship. It also provided better arcs

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THE NEW ORLEANS AND WICHITA CLASSES

Minneapolis is shown in her late-war configuration (October 1944 at Leyte Gulf) in the first two profiles. As opposed to early war New Orleans-class ships, the forward superstructure has been reduced and an SK radar placed on the foremast. The 1.1in quad mounts have been replaced by 40mm quads, and another pair added on top of the hangar. Up to 25 single 20mm mounts can be seen, many in the reworked area between the two stacks. The ship is wearing unique camouflage scheme Ms 8, which was intended to make the cruiser look like a two-stack destroyer. Note the false life raft and sheer line. The stacks are also being made to look smaller with shading, and other parts of the ship were dappled to break up their lines. The third profile is *Wichita*, which had a unique appearance among all treaty heavy cruisers. The two stacks are tightly spaced together and the aircraft-handling facilities have been moved to the fantail, as is evident by the placement of the catapults and crane. Note the placement of the secondary battery is also much different, with two mounts placed on the centerline fore and aft of the superstructure. The 8in turrets are also of a different design. *Wichita* provided the template for all subsequent USN heavy cruiser designs. The ship is in Ms 22 Graded System, which was preferred late in the war since it provided deception against air and submarine observation.

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of fire for the antiaircraft weapons situated amidships. One large crane on the fantail serviced the two catapults. Stowage space on a below-deck hangar, covered by a large siding hatch, could accommodate four aircraft.

Wichita Class Construction				
Ship	**Built at**	**Laid down**	**Launched**	**Commissioned**
Wichita (CA-45)	Philadelphia Navy Yard	28/10/935	16/11/1937	16/2/1939

Wichita Class Specifications (as built)	
Displacement	10,589t standard displacement; 13,015t full load
Dimensions	Length 608ft, 4in overall; Beam 61ft 9in; Draft 23ft 9in
Speed	33.6kt
Range	8,800nm at 15kt
Crew	863 (rising to 1,343 by 1945)

Armament

The armament of the new class was also substantially enhanced. The main battery remained the customary nine 8in guns in three triple turrets, but the guns were placed in new mountings. This turret featured a greater separation of the gun barrels, which corrected the problem with dispersion. The turret was also heavily armored with 8in of face armor, 3.75in on the sides and 2.75in on the roof. The mounting also featured better training and elevating speeds. The main battery was supported by two advanced Mk 34 fire-control directors.

For the secondary battery, the move was made from the cruiser-standard 5in/25 gun to the newer 5in/38 gun. This had already proved successful on destroyers and carriers, and would become generally considered as the best dual-purpose weapon of the war. The gun had a greater range and a better rate of fire than the older 5in guns. The layout of the secondary armament was also enhanced with two of the guns placed on the centerline, which provided fore and aft coverage. Because of top-weight considerations, the 5in guns were placed in single, not twin, mounts. These were the Mk 30 5in mounts unique to *Wichita*. Four of these were enclosed, marking the first time an American cruiser received an enclosed 5in mount. Two Mk 33 directors supported the 5in battery. *Wichita* was completed with the totally inadequate light antiaircraft armament of only eight .50-cal machine guns.

In 1942, *Wichita* spent much of her time assigned to the British Home Fleet. Here she is in a striking Ms 12 scheme (modified) with carrier *Wasp* in the background. (*Ships of the World*)

Service Modifications

Wichita's first modifications were to increase the ship's antiaircraft fit. By 1942, two quad 1.1in mounts were added and the machine guns replaced by 20mm single guns. The number of 20mm guns increased to 22 by 1944, but was lowered to 18 in 1945 as top weight became critical.

In late 1943, she underwent a three-month overhaul in Bremerton. During this period, her appearance was altered by the construction of

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a smaller forward superstructure to reduce top weight and to provide better arcs of fire for the much-increased antiaircraft suite. In addition to the 20mm single mounts, four quad 40mm and two twin 40mm mounts were included. The radar suite was also extensively upgraded. Later in the war, two further twin 40mm mounts were added on the stern in response to the kamikaze threat.

Wartime Service

Wichita was one of the few American heavy cruisers to see significant service in both the European and Pacific theaters. For this service, she received 13 Battle Stars. The beginning of hostilities found *Wichita* in Iceland. She remained in the Atlantic and joined the Home Fleet in April 1942. She operated under British command and provided cover for convoys PQ-15 and PQ-16 to northern Russia. The next convoy, PQ-17, was savaged by German air and submarine attack in early July, after *Wichita* and the other covering units were ordered to withdraw. Her next operation was as part of the invasion of North Africa. On November 8, she dueled with French shore batteries and suffered a single 194mm hit that wounded 14 men but caused no serious damage. Later that same day, *Wichita* engaged a French light cruiser and narrowly avoided torpedoes from a French submarine.

In early 1943, *Wichita* was sent to the Pacific; her first action was at the battle of Rennell Island on January 29. *Wichita* was hit by an air-launched torpedo, but the weapon was a dud. The cruiser moved into the northern Pacific to participate in the re-occupation of Kiska and Attu in the Aleutians. In January 1944, she was assigned to the Fast Carrier Force and participated in the Marshall Islands campaign and the Truk raid in February. She continued to screen the carriers through the battles of the Philippine Sea and Leyte Gulf. At Leyte, she and *New Orleans* finished off a crippled Japanese light carrier and a destroyer on October 25. She was heavily engaged at Okinawa in 1945, where she fought both Japanese aircraft and shore batteries. After the war, she was placed in reserve in 1946 and sold for scrap in 1959.

ANALYSIS AND CONCLUSION

The first generation of USN treaty cruisers were generally regarded as unsuccessful designs, especially in comparison with their Japanese contemporaries. The second class of first-generation ships (the Northampton class) featured incremental improvements, but the ships were still underweight and inadequately protected. Once American designers realized that they had an extra 1,000t to work with, the second generation of treaty cruisers were much improved and proved to be formidable ships. These were balanced designs that were much better protected, while still maintaining a heavy armament. The Wichita class was a mostly successful prototype for subsequent cruiser designs. The new 8in turret proved effective and was standard on the very successful Baltimore class that followed. The layout of the secondary armament was much

Wichita in 1943 in an Ms 22 scheme in Northern Pacific waters. This design served as the departure point for all subsequent classes of American heavy cruisers.(*Ships of the World*)

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better, but still the design was constrained by the overall tonnage limitation. The main problems of this design, trying to jam too much onto too small a hull and the inadequate secondary armament, were not remedied until designers were freed from tonnage limitations. The result was the Baltimore class, which produced easily the most powerful heavy cruisers of the war.

The war record of USN treaty cruisers presents a mixed picture. This was particularly true of the supposedly better-protected New Orleans class, which saw three ships sunk in a single night. In this case, the destruction of these ships was not due to any design problem, but to a general lack of battle readiness shared by all USN ships at this point in the war. Each of the three ships was subjected to a storm of accurate 8in shellfire from fairly close range that no cruiser could have survived. Two of the ships were also torpedoed, ensuring their destruction. The remaining New Orleans-class ships served throughout the war in a number of roles and were highly successful. On occasion, they showed themselves able to take considerable damage and survive.

The primary shortcoming levied against USN treaty cruisers was indeed their inability to take damage and survive. This seems overblown since, in most instances where a ship was lost, the level of damage would have been fatal to any cruiser. Of the seven ships sunk, five fell into this category. The other two succumbed to two torpedoes, whereas on another occasion two torpedoes in fact failed to sink a treaty cruiser. These ships survived significant damage a number of times. The table below lays out all instances of severe damage suffered by treaty cruisers during the war.

Major Wartime Damage to USN Treaty Heavy Cruisers

Ship	Agent of Damage	Date	Fate
Pensacola	1 torpedo	30/11/1942	Survived
Salt Lake City	3 8in shell hits	12/10/1942	Survived
	2 shell hits	27/3/1943	Survived
Northampton	2 torpedoes	30/11/1942	Sunk
Chester	1 torpedo	20/10/1942	Survived
Louisville	2 kamikazes	6/1/1945	Survived
Chicago	1 torpedo	9/8/1942	Survived
	6 torpedoes	29–30/1/1943	Sunk
Houston	Numerous shell hits, 3 torpedoes	1/3/1942	Sunk
Portland	1 torpedo	13/11/1942	Survived
Indianapolis	2 torpedoes	30/7/1945	Sunk
New Orleans	1 torpedo	30/11/1942	Survived
Astoria	34–63 shells hits	9/8/1942	Sunk
Quincy	54 shell hits (est), 2 torpedoes	9/8/1942	Sunk
Vincennes	74 shell hits (est), 3 torpedoes	9/8/1942	Sunk
Minneapolis	2 torpedoes	30/11/1942	Survived
San Francisco	45 shell hits (est)	13/11/1942	Survived

The natural inclination is to compare American treaty cruisers to their Japanese counterparts. Both were powerfully armed, but in this regard the only real difference was that the Japanese ships retained a heavy torpedo battery. This was especially significant since the Japanese torpedo was the powerful Type 93. These torpedoes played important and even decisive roles in the battles of Java Sea and Savo Island. However, it is important to point

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out that the inclusion of torpedoes on their cruisers was a double-edged sword for the Japanese. The loss of three Japanese heavy cruisers was directly attributable to the explosions of their own onboard torpedoes, and another two were severely damaged in this manner.

Ultimately, Japanese heavy cruisers were exposed to having a fatal flaw – vulnerability to air attack. Despite a growing number of light antiaircraft guns, this vulnerability increased as the war went on. In contrast, American treaty cruisers possessed a higher degree of protection from air attack by virtue of better fire-control systems and the development of a successful medium antiaircraft gun, which the Japanese never had. To be fair though, American cruisers were never subjected to the scale of air attack that Japanese cruisers were later in the war. Thus, it is impossible to judge whether American treaty cruisers would have been significantly better in defending themselves against heavy air attack.

Even comparing USN and IJN treaty cruisers at all is unfair on a certain level. While the Americans were using every possible weight-saving measure, the Japanese were not as diligent and came in with designs that were considerably overweight. This became practice, resulting in larger ships that had a greater capacity to take damage and the additional displacement to carry both a large gun and torpedo armament.

On balance, American treaty cruisers must be judged as successful ships. They performed well in their intended roles, and were instrumental in turning the tide against the Japanese. For this, six were sunk in 1942, joined by one other just days before the end of the war.

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INDEX

References to images are in **bold**. References to plates are in **bold** with captions in brackets.

armament 7, 8–10
  New Orleans class 36, **37**
  Northampton class 20–21
  Pensacola class **12,** 13, **A** (14, 15)
  Portland class 28
  Wichita class 44
armor
  New Orleans class 32
  Northampton class 18
  Pensacola class **8,** 11
Astoria, USS **9,** 33, 36, 37, 38–40, **40,** 46
atomic bomb tests 16, 30
Augusta, USS 10, 20, **20, 21,** 21, 22, **22,** 25

Brooklyn class 42

Cape Esperance, battle of (1942) 16, 41
Chester, USS **5,** 10, 20, 21, 22, **23,** 23, **24,** 46
Chicago, USS **4, 7,** 10, 20, **21,** 21, 22, **22,** 24, **25,** 46
Coral Sea, battle of the (1942) 5, 23, 24, 38, 40

D-Day (1944) 25, **F** (38, 39), 41
design and construction 6–8
  New Orleans class 30–33
  Northampton class 17–20
  Pensacola class 11–12
  Portland class 25–28
  Wichita class 42–45
Doolittle raid (1942) 16, 23

Eastern Solomons, battle of the (1942) 38, 40, 41
Enterprise, USS 13, 16, 23, 29

Gilbert Islands campaign (1943) 14, 23, **24,** 29, 30, 38, 40, 41
Guadalcanal campaign (1942) 5–6, 13–14, 16, 23, 24, 29, **E** (34, 35), 38, 40, 41, **41**

Hiei (Japanese ship) 29, 41
Hornet, USS 13
Houston, USS **20,** 20, 21, 22, 24–25, **C** (26, 27), 46

Indianapolis, USS **28,** 28–30, **29, D** (30, 31), 46
Iwo Jima, campaign (1945) 14–16, 23, 30, 41

Java Sea, battle of the (1942) 24–25, **C** (26, 27), 47

Kommandorski Islands, battle of (1943) 16–17

Lexington, USS 13, 29
Leyte Gulf, battle of (1944) **B** (18, 19), 24, 38, 40, 45
London Naval Treaty (1930) 7–8, 32
Louisville, USS **4, 5, B** (18, 19), 20, 21, 22, **22,** 23–24, **25,** 46
Luzon, invasion of (1945) 24, 29, 40

Marshall Islands campaign (1942) 14, 16, 23, 29, 30, 38, 40, 41, 45
Midway, Battle of (1942) 5, 13, 23, **29,** 29, 38, 40
Minneapolis, USS 8, **32,** 33, 37, 40, **40, G** (42, 43), 46
Myoko class (Japanese) 11

naval strategy 4–6
New Guinea campaigns
  1942: 13, 40–41
  1944: 29
New Orleans, USS **6, 32,** 33, 37, **37, 38,** 38, 46
New Orleans class 7, 8, **20**
  analysis and conclusion 46
  armament 8, 36, **37**
  Astoria **9,** 33, 36, 37, 38–40, **40,** 46
  design and construction 30–33
  Minneapolis 8, **32,** 33, 37, 40, **40, G** (42, 43), 46
  New Orleans **6, 32,** 33, 37, **37, 38,** 38, 46
  Quincy 8, 33, **33,** 36, 37, 38–40, 46
  radar **E** (34, 35), **37, F** (38, 39), **40**
  San Francisco 8, 33, **E** (34, 35), 37, **37,** 40–41, **41,** 46
  service modifications 36–37
  Tuscaloosa **7,** 8, 33, **36,** 37, **F** (38, 39), 41
  Vincennes 8, 33, **36,** 36, 37, 38–40, 46
  wartime service 38–41
Normandy invasion (1944) 25, **F** (38, 39), 41
North Africa campaign (1942) 41, 45
Northampton, USS **4, 5,** 10, **18, B** (18, 19), 20, 21, 22, **23,** 23, 46
Northampton class
  analysis and conclusion 45
  armament 8, 9, 20–21
  Augusta 10, 20, **20, 21,** 21, 22, **22,** 25
  Chester **5,** 20, 21, 22, **23,** 23, **24,** 46
  Chicago **4, 7,** 20, **21,** 21, 22, **22,** 24, **25,** 46
  design and construction 17–20
  Houston **20,** 20, 21, 22, 24–25, **C** (26, 27), 46
  Louisville **4, 5, B** (18, 19), 20, 21, 22, **22,** 23–24, **25,** 46
  Northampton **4, 5, 18, B** (18, 19), 20, 21, 22, **23,** 23, 46
  radar 10, **B** (18, 19), **23**
  service modifications 21–22
  wartime service 23–25

Okinawa campaign (1945) 16, 24, 29, 30, 38, 40, 41, 45
Omaha class 6, 7
Operation *Torch* (1942) 41, 45

Pearl Harbor, attack on (1941) 5, 38, 40
Pensacola, USS **6, 8,** 10, **11, 12,** 12, 13–17, **14, A** (14, 15), **17,** 46
Pensacola class
  armament 8, 9, **12,** 13, **A** (14, 15)
  design and construction **8,** 11–12
  Pensacola **6, 8, 11, 12,** 12, 13–17, **14, A** (14, 15), **17,** 46
  radar 10, 13, **A** (14, 15)
  Salt Lake City **4, 5, 6, 12,** 12, 13, **A** (14, 15), **16,** 16–17, 46
  service modifications 13, **16**
  wartime service 13–17
Perth, HMAS **C** (26, 27)
Philippine Sea, battle of the (1944) 24, 30, 40, 45
Portland, USS **5, 26,** 28–30, **29, 30, D** (30, 31), 46
Portland class 7
  armament 28
  design and construction 25–28
  Indianapolis **28,** 28–30, **29, D** (30, 31), 46
  Portland **5, 26,** 28–30, **29, 30, D** (30, 31), 46
  radar **29, 30, D** (30, 31)
  service modifications 28–29
Potsdam Conference (1945) 25

Quincy, USS 8, 33, **33,** 36, 37, 38–40, 46

Rabaul campaign (1942) 13, 40
radar 10
  New Orleans class **E** (34, 35), **37, F** (38, 39), **40**
  Northampton class **B** (18, 19), **23**
  Pensacola class 13, **A** (14, 15)
  Portland class **29, 30, D** (30, 31)
Ranger, USS 41
Rennell Island, battle of (1943) 23, 45

Salt Lake City, USS **4, 5, 6, 12,** 12, 13, **A** (14, 15), **16,** 16–17, 46
San Francisco, USS 8, 33, **E** (34, 35), 37, **37,** 40–41, **41,** 46
Santa Cruz, battle of (1942) 13, **23,** 29
Saratoga, USS 38
Savo Island, battle of (1942) 16, 47
service modifications
  New Orleans class 36–37
  Northampton class 21–22
  Pensacola class 13, **16**
  Portland class 28–29
  Wichita class 44–45
Sunda Strait, battle of the (1942) **C** (26, 27)
Surigao Strait, battle of the (1944) 24, 29, 40

Tassafaronga, battle of (1942) 14, **17,** 23, **37,** 40
Tuscaloosa, USS **7,** 8, 33, **36,** 37, **F** (38, 39), 41

Vincennes, USS 8, 33, **36,** 36, 37, 38–40, 46

wartime service
  New Orleans class 38–41
  Northampton class 23–25
  Pensacola class 13–17
  Portland class 29–30
  Wichita class 45
Washington Naval Treaty (1922) 5, 6–7
weapons *see* armament
Wichita class 8, **42, G** (42, 43), **44, 45**
  analysis and conclusion 45
  armament 8, 9, 44
  design and construction 42–45
  service modifications 44–45
  wartime service 45

Yorktown, USS 13

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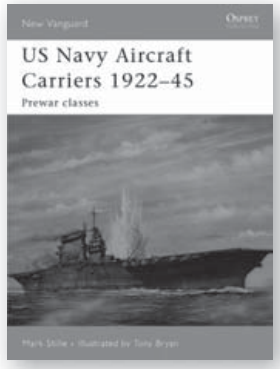

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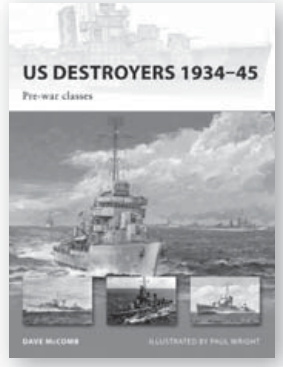

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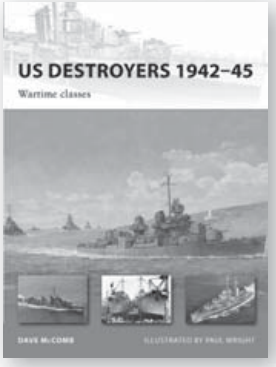

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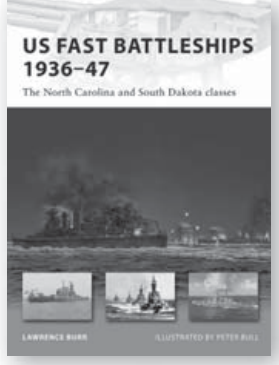

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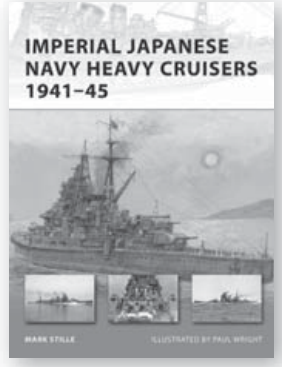

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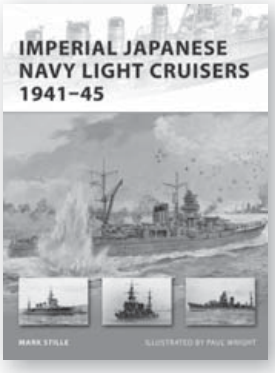

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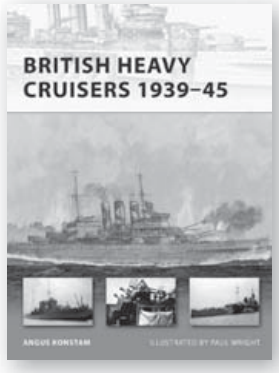

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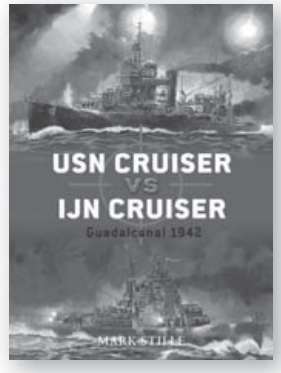

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Editor's Note

For ease of comparison please refer to the following conversion table:

1 mile = 1.6km

1yd = 0.9m

1ft = 0.3m

1in = 2.54cm/25.4mm

1 gallon (Imperial) = 4.5 litres

1lb = 0.45kg